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The Reception of a Feminist Critique of Science:
Primate Visions (1989) Revisited

by

Luciana Marie Pizzi Sivertson ©

A thesis submitted to the Faculty of Graduate Studies and Research in partial fulfillment of the requirements for the degree of Master of Arts

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The undersigned certify that they have read, and recommend to the Faculty of Graduate Studies and Research for acceptance, a thesis entitled THE RECEPTION OF A FEMINIST CRITIQUE OF SCIENCE: *PRIMATE VISIONS* (1989) REVISITED submitted by Luciana Marie Pizzi Sivertson in partial fulfillment of the requirements for the degree of Master of Arts.

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Dedicated to my husband and to my mother for their love, support, and encouragement.

ABSTRACT

Donna Haraway's book *Primate Visions* (1989) illustrates how historical, social, and cultural context influence scientific practice, a familiar debate. Yet, her feminist challenge of the conventional meanings of science sparked a striking range of reactions from scholars in various disciplines. The reactions indicate the presence of a contemporary controversy over the meaning of science. Discourse analysis was used to examine the controversy found in 61 reviews of *Primate Visions*. Eight primatologist/biologist reviewers wrote unfavourable reviews, representing the conventional view of science. Four primatologists wrote mixed reviews. All other scholars (with one exception), including feminist scientists, wrote favourable reviews, favoring alternative views of science. The degree of reflexivity, awareness of the way cultural values influence one's understanding of the world, influences whether Haraway is perceived favourably or not. The thesis ends with some recommendations to improve communication between scholars who express different points of view.

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CHAPTER I

INTRODUCTION

Nature of the Problem

> Haraway also tried to make [postmodernism] clear to me. She explained it as a mirror glass skyscraper which reflects a kaleidoscope of sky and other buildings and the observer shifts her own standing place. Maybe so. But some of us still believe that if enough scientists stand in different places, and on each others' shoulders, we'll get past the game with mirrors to describe the building itself (Jolly 1990: 58).
>
> The less knowledgeable may greet [*Primate* Visions] with enthusiasm; those with firsthand experience are likely to find it, at best, frustrating. This is a pity, for it underscores the gap between these two camps (Dunbar 1990: 30).
>
> Their dialogue, as the French historian Fernand Braudel once put it, is usually 'a dialogue of the deaf' (Burke 1992: 3).

The past two decades have witnessed a myriad of critiques of science, generating discussion about the ways in which historical, social, and cultural context influences scientific practice. Although this discussion is familiar, Donna Haraway's *Primate Visions* (1989), a feminist critique of science, was met with a spectacular reception. Her book received at least 61 book reviews, a remarkable number for any book. The reviews represent varying viewpoints or "camps": among these, a "kaleidoscope of sky" viewpoint and "the building itself" viewpoint, resulting in what could be called a "dialogue of the deaf". Even though Haraway's book is significant on its own grounds, my thesis focuses on the varied reception of Donna Haraway's *Primate Visions* (1989), and on the viewpoints of science represented in these reactions.

Primate Visions is a history of the field of primatology, the study of apes and monkeys, but it is also about how cultural and social context influences the practice of primatology. Because Haraway, using feminist theory and rhetoric, challenges the notion of impartiality in science and threatens foundations of science that were once presumed unchallengeable, some book reviewers, depending on their viewpoint, use words like "personal attack" to convey what Haraway is doing, while others feel that her work is a longcoming revelation. All reviews are rather passionate, and not what one usually expects to read in a scholarly critique. Reactions range from "scholars cannot take this biased story of primatology seriously" (primatologist Peter Rodman 1990: 486) to "*Primate Visions* has changed my life" [Anne Fausto-Sterling (1990: 329), a feminist biologist who, like Haraway, has written about the intersection between feminism and science]. Matt Cartmill, a practicing primatologist who believes that Haraway is attacking primatology, says that "[Haraway] would have been happier still if I had blown out an artery" (Matt Cartmill, 1991: 67). Other reviewers express the notion that this book is quite delightfully not an example of what Sharon Traweek, an anthropologist of science, calls "rigor mortis (sorry I meant rigorous methods)" (Traweek 1992: 427). A first glance at these kinds of reactions indicates that they are not only varied, but quite polarized.

Donna Haraway

Understanding Haraway's book is central to understanding the reception of her book (Chapter 2 will discuss her work in more detail). Haraway's main goal in *Primate Visions* is to criticize the meaning of science. What does science mean? What does nature mean? Haraway proposes to integrate many different perspectives in her social study of science, and in the end covertly creates her own perspective, one that finds its roots in the field of "cultural studies". Her particular kind of criticism of science is concerned with the meaning, interpretation and destabilization of texts written by primatologists, an ambitious undertaking indeed. Despite her ambiguous, openly semiotic text, Haraway does clearly bring to light gender, class, and race bias in the early practice of primatology, displaying the ways in which historical, social, and cultural context impinge on the practice of primatology. At other times she is not so clear, probably because the issues she deals with are difficult. She describes academic scholarship, fieldwork, more popular accounts of primate social life, and the work of key primatologists. She is interested in commenting more on how descriptions of primate life are produced than in describing the activities of primatologists themselves, for they serve as case studies for a grander epistemological debate. In other words, she engages in more of an extrinsic, rather than intrinsic, study of primatology, challenging conventional conceptions of truth.

For example, she suggests that primatologists' findings are produced as well as discovered, and that the acknowledgment of this interaction has contributed to the success of some key contemporary primatologists. Haraway suggests that some women, who call themselves feminists as well as scientists, are writing more inclusive accounts of primate life because they emphasize the differences between earlier male biased descriptions of primate social life and newer revised accounts. In addition, their focus is on female primates as well as male primates. For Haraway, these women are more closely connected to the phenomena to be observed, not by virtue of their sex , but because they are a group of marginalized scientists practicing primatology in the 1980s.

The Epistemological Debate

In reacting to *Primate Visions*, reviewers are caught in a central postempiricist epistemological debate[1]. Traditional views hold that science is different from other forms of knowledge. These views postulate that the world is comprehensible, the subjective knower and the objective world are separate, validation can provide accurate information about the world, the social world is ordered, and that there is a "unity of the sciences" (Neilsen 1990: 4-5). These ideas are being challenged by revisionist scientists, feminists, and social critics of science. Many scholars still believe that good science is reality driven and is about objectivity and the discovery of nature. Nonetheless it is clear, as evidenced in the reception of *Primate Visions,* that critics of science, feminist theorists, and a small handful of feminist primatologists are challenging the traditional meaning of science. Some scholars with extreme viewpoints do not even wish to enter the debate. Scholars, scientists and critics, who are intrigued by this debate are asking many questions. What role do values play in science? What are the established rules in a specific discipline? Does everyone follow them? How is consensus on theories and facts achieved? How does a scientist practice *good* science when she acknowledges that cultural biases play a role in scientific inquiry? What are the criteria for choosing between theories? What are scholars' conceptions of truth? Is the world knowable? To what extent are our ideas about nature influenced by social structure? Would physical scientists and social scientists answer these questions in the same way? What sort of metatheoretical assumptions are involved in science? These are central questions in the postempiricist world.

---

[1] Neilsen refers to the "postempirical crisis in knowledge" (1990: 7).

The debate has not gone unexplored. For example, philosophers such as Helen Longino (1987, 1990), Longino and Doell (1983), and Sandra Harding (1986, 1987) have devoted considerable time to this debate from the feminist perspective. Sociologists such as Michael Mulkay, Nigel Gilbert (Mulkay 1991; Mulkay and Gilbert 1984), Steve Woolgar (1988a, 1988b) and Bruno Latour (Latour 1981, 1988; Latour and Woolgar 1979) have explored the debate from the perspective that knowledge is mostly produced rather than simply discovered. They have also questioned the metatheoretical presuppositions of their methodology. Others have explored how social factors, such as gender, play a role in science, especially in primatology (Fedigan 1994; Fedigan 1995; Fedigan and Fedigan 1989; Latour and Strum 1986; Sperling 1991; Strum and Fedigan 1995). Donna Haraway has been writing about the field of primatology and about primatologists for almost two decades (1978a, 1978b, 1979, 1981, 1982, 1983a, 1983b, 1986). Her book *Primate Visions: Gender, Race and Nature in the Modern World of Science* (1989) marks the climax of her work in primatology, wherein she explores primatological discourse by re-formulating Western conceptions of science. Reviews of *Primate Visions* exhibit a diversity of reactions to Haraway's ideas, **reviving** the epistemological debate.

Overview of Methodology

Many kinds of studies have focused on the evaluation of scholarly work. Most studies have focused on evaluations prior to publication, such as peer reviews. While a great deal of attention has been devoted to the study of the peer review process, and how this process selects acceptable explanations based on social or internal disciplinary influences (e.g., Adams 1991; Ciccheti 1991; Cole 1991; Fuller (1993) [1991]; Longino 1990; Meyers 1993; Mulkay and Williams 1971; Peters and Ceci 1982 and 1985), a dearth of empirical studies exists on the formal evaluation and reception of scientists' work *after* publication, particularly with respect to publications that question the authority of science. Put more simply, analyzing the reception of critiques of science, much less feminist ones, is a rarefied practice. The study of post-publication reception is a complex process that involves examining ensuing citation, and surveying efforts to replicate experiments and test hypotheses (Longino 1990). Reader-response criticism (e.g., Fish 1980; Brodkey 1989) is another way to study post-publication reception. Reader response criticism is concerned with comprehending the ways in which a single reader or a group of readers of a certain gender or class receives texts (Childers and Hentzi 1995: 253). This thesis focuses on the ways readers received *Primate Visions* and uses discourse analysis to examine reviews written by scholars in different disciplines. This type of analysis focuses on language, rhetoric, and meaning found in the reviews, and asks:

- Who liked *Primate Visions*? Who disliked it?
- How is *Primate Visions* interpreted by different academic communities and how is that message conveyed through language use and rhetoric?

Two main objectives of my analysis are to understand the aspects of *Primate Visions* the reviewers like and dislike, and to understand their meaning of science as represented in their reactions. I will explore the specific points of contention found in the reviews, and provide some reasons for these differences. I will also evaluate the permeation or the demise of ideas across disciplinary boundaries; for example, there is a tendency for some reviewers in the biological sciences to associate Haraway with postmodernism and with radical relativism, whereas reviewers in other disciplines, for the most part, do not to make this association.[2] These are the viewpoints on the meaning of science which inform readers' responses. The passion and variability of the reactions makes them interesting subjects for discourse analysis (Chapter 3 will discuss my methodology in more detail).

The Chasm Between Scientists and Critics of Science

Polarized viewpoints or "camps" represented in the published reviews of *Primate Visions* represent a communication gap. A small handful of post-publication studies show a differential reception of publications that question scientific authority. These studies demonstrate that communication gaps have existed for some time and that there is a need to address this gap.

For example, Feyerabend (1978) concluded that the critical reviewers of his book *Against Method* (1975), which criticized rationalism, "were not too bright and rather badly informed and quite naturally made fools of themselves" (Feyerabend, 1978: 37). Davis (1983) examined differences in reception between academics who responded critically, and the public who responded favorably, of Stephen Jay Gould's book *The Mismeasure of Man*. This book exposed racism and inconsistencies in studies that attempted to measure intelligence over the years. Davis concluded that "Gould's own degree of bias is unusual in a work by a scientist" (47), and "he proceeds as though objectivity is a myth and no factual reality can be discovered", and finally, that the popular press should be just as critical as the academics by paying attention to the role the natural world plays in the validation of scientific theories. Coleman and Salamon (1988) note, in their study of the reception of Kuhn's *Structure of Scientific Revolutions* (1962), in the psychology literature, that the reception is generally favorable in the 15 year time period between 1969 and 1983, but that Kuhn was cited most often in philosophical-methodological articles, and not often in the experimental psychology literature.

---

[2] "A theory is said to be relativistic when it cannot provide criteria of truth independent and outside of itself; beliefs, theories, or values are claimed to be relative to the age or society that produced them and not valid outside those circumstances" (Abercrombie, Hill, and Turner 1988: 206).

The reception of the feminist critique of science in particular "has not been an altogether positive one" according to Evelyn Hammonds who studied the opposition between feminist theorists and feminist scientists, notably engineers and mathematicians (in Longino and Hammonds, 1990: 176). The reason for this kind of reception, she says, is the "central conflict" over "the interpretation of 'science', 'gender', and 'feminism'" (176-177). David Berreby (1994), in his article about the famous critic of science, Bruno Latour, noted the wide gorge between scientists and the social critics of science. Berreby points out that Gross, a scientist, and Levitt, a mathematician, suggested that Bruno Latour, an infamous sociologist of science, was "antiscientific." Latour, in response, said that they have "chosen me wrongly" and that he loves science. Similarly, physicists at the Institute for Advanced Studies where Latour was once a candidate for a position, did not want Latour on staff. They concluded that it was inappropriate to study modern science and worried about receiving funding if their science was described as something else. In her introduction to *Secrets of Life and Death* (1992), a series of essays on gender and science, Evelyn Fox Keller noted that the "confidence and respect I continued to have for 'science' was lost on those critics-mostly from the ranks of 'working scientists,' but sometimes also from the history and philosophy of science-who read in my work only an attack on both *science* and *objectivity*" (Keller 1992: 2 original emphasis).[3] If scholars believe that science studiers' agenda is to attack science and objectivity, then communication between these scholars has indeed become, in Peter Burke's words, a "dialogue of the deaf." McCaughey (1993) has suggested that the scientific community needs to be more democratic and listen to non-elite groups. Since science is a social activity, only then will science move forward.

Why Does the Chasm Exist

Why do these communication gaps exist? Why are there differences over the way science should be perceived and practiced? Gary Lease (1995) points out that one of the major differences between natural scientists and humanists is their view of nature. Scientists see nature as autonomous, or "out there", while social scientists and humanists see it as being constructed.[4] For Lease, "the distinction between the invention of nature as cultural construction and the invention of specific biophysical contents should be the main point of departure" for any dialogue that addresses differences between the two groups of scholars

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[3] It should be noted that while scientists often criticize "critics of science", so do philosophers and historians of science who espouse traditional views of science (e.g. Soble 1994). Yet, in my investigation, none of the philosophers or historians of science were seen to react unfavourably to Haraway's critique of science.

[4] These are not new ideas. Lowther (1962) described how two different conceptions of truth (correspondence and coherence) could be applied to archeological statements. The correspondence conception of truth implies that facts are separated from values, and that observations and statements should be judged by their correspondence to reality. The coherence conception of truth means that the truth of an observation or statement resides in its coherence within an assemblage of other observations and statements or "judgments" (Lowther 1962 and Alcoff 1987).

(1995: 7). The important question for him then becomes: "Is nature 'out there' or do we create it?" (1995: 7-8)

While Lease's question, is an important one, and no doubt plays a role in understanding the difference between views, I do not think the problem of the lack of dialogue between the two worlds can be addressed in such simple terms. For one thing, although we might accept that opposing perceptions of the natural world do play some intangible role in defining knowledge in different disciplines, the two conceptions of truth are not always and necessarily perceived as dichotomous. For example, a scientist can have for the most part a conventional view of truth, but he/she might also believe that social factors to some extent play a role in scientific inquiry (characteristic of an unconventional view of truth). In posing his question in strict dichotomous terms, Lease, I think, widens the gap in communication and suggests that scientists are not self-reflexive (or do not question their own presumptions), or that critics of science completely dismiss the idea that nature or scientific knowledge can be discovered as well as produced.[5]

Sometimes a lack of dialogue between scholars representing different views is a result of misinterpretation. For example, science studiers have been accused of being anti-scientific (by both scientists and philosophers); however, many science studiers are pro-science, even though they critique it.

Evelyn Fox Keller (1987) suggests that there is a misunderstanding between women scientists and feminist critics (and other social critics of science) partly because neither group knows how nature and culture relate mutually with each other in the construction of scientific knowledge. Helen Longino (Longino and Hammonds 1990) may be partly correct in saying that Donna Haraway has been misread.

---

[5] Lease's argument resembles Lankford's (1981 in Golkalp 1987) suggestion that the dispute over the differences between astronomical observations made with a small telescope and those made with a large one depended mostly on the notably "different perceptions of the natural world" between two groups of scholars standing up for antithetical interests (Golkap 1987: 553). Shapin describes this same situation by saying that judging the validity of these experiments depends on "pre-existing views of the reality of the phenomenon to be detected by the experiments" (Shapin 1982 in Gokalp 1987: 553).

Lease's (1995: 7) suggestion that "[scientists] may be unaware of the dialectics occurring in other disciplines" and that scientists sometimes fail to appreciate the degree to which their concepts are culturally determined may be partly correct. However, Lease is also correct in urging *both* cultures (scientists and science critics) to communicate and learn from each other:

> Despite the problems of communication across the 'two-culture' gap, we believed that all the parties, including historians, sociologists, and biologists, have much to learn from each other and that cross disciplinary contacts can promote teaching and research collaborations, [and] the advance of knowledge (7).

Haraway's claim - that science is an interaction between nature (what is) and culture (what is made) - is being *interpreted* differently by scholars in different academic communities. The remainder of this thesis explores Haraway's view of the meaning of science, the reactions to her ideas, and the reviewers' views of science. These views of science are interpreted as discourses where language is "unified by common assumptions" (Abercrombie, Hill, and Turner 1988: 71).

CHAPTER II

FEMINIST CRITIQUES OF SCIENCE AND SITUATING DONNA HARAWAY

Introduction

In this chapter I begin with a brief exploration into *Primate Visions* and Haraway's analytical approaches. I then give a brief overview of the general field of science studies before discussing feminist critiques of science, wherein I situate Haraway's work using examples from *Primate Visions*.

Feminist critiques of science are complex and difficult to generalize, but it is possible to identify characteristics of particular critiques. Confusion among feminists, scientists, social scientists, and other scholars over the meaning of sex, gender, science, and nature, has sparked a number of critiques of science. Feminist empiricism, standpoint epistemology, power issues in the scientific enterprise, poststructuralism, critical theory, and postmodernism are examples of further distinct critiques of science. Haraway makes use of all these critiques to arrive at her own.

Situating Donna Haraway

Before reviewing different kinds of feminist critiques of science, I will briefly summarize Donna Haraway's thesis. *Primate Visions: A History of the Craft of Story Telling in the Sciences of Monkeys and Apes* was one title Haraway thought she might use for her book, eventually entitled and published as *Primate Visions: Gender, Race, and Nature in the World of Modern Sciences* (1989), even though the former would have been just as appropriate. The weaving together of three key words in the latter title form the important question that Haraway raises. How have gender, race, and nature affected primatologists' understanding of nature? This question leads to others raised by Haraway's analysis. How is science embodied in narrative? How is nature an object of ideological contention? How are gender, knowledge, and the power of science important themes in the study of primatology? Over the years, how has primatology become a "genre of feminist theory," and the "politics of being female"? What do these questions mean for the future of scientific inquiry? By attempting to answer these questions, Haraway's analysis goes beyond a simple chronological history of primatology; it taps into how social context influences the practice of primatology.

Haraway's adventure begins with an exploration of primatology in different disciplines, such as psychology before World War II. The American Museum of Natural History, dioramas, taxidermy, hunting, photography, Teddy Roosevelt, and Carl Akeley are objects or subjects of study in Haraway's accounts of early primatology. Sexism towards wives and racism towards black trackers, as well as nationalism and colonialism, are elucidated in this story titled "Teddy Bear Patriarchy". Haraway paints a disturbing picture of stuffed animals, especially stuffed gorillas to show how early primatology focused on control over animals.

Robert Yerkes enters the adventure next. A psychologist who called his science psychobiology made personality an "object of knowledge". Personality was central to psychobiology "as a technology or power over labor: The worker and the family" (65). Again, Haraway seeks to expose how control was central to primatology. A discussion of semiotics, the science of signs, in relation to Clarence Carpenter and Stuart Altman follows, where she shows how both human and biological sciences worked together.

Thus, the works of Carl Ackeley, Robert Yerkes, Clarence Carpenter and Stuart Altmann, prominent figures in the early years of primatology, are used not only to illustrate how sexism and racism were embedded in primatological discourse, but also how methodologies from both the human and biological sciences could be utilized to examine the natural world. Haraway does not limit her study of nature to academic scholarship. She studies the meaning of nature in popular culture as well. For example, Haraway discusses Teddy Roosevelt to show how distorted images of nature were not confined to the academic world alone.

The Second part of the book deals with primatology after World War II. Jane Goodall and the chimpanzees she studies are cast as scapegoats for problems between white men in the West and the Third World: "How do race, species, gender, and science codes work to reinvent nature in the Third World for First World audiences within post-colonial, multinational capitalism?" Haraway then discusses Sherwood Washburn, "Man the Hunter", and the New Physical Anthropology followed by Harry Harlow and his research on deprivation and surrogate mothers. The "Man the Hunter" hypothesis is discarded for newer theories about hunter gatherers. Another chapter focuses on Japanese and Indian primatology. Haraway's discussion of Japanese primatology, one of the most fascinating parts of the book, draws on the research of Pamela Asquith, a philosopher who currently teaches in the Department of Anthropology at the University of Alberta. In this section, she shows how culturally specific discourses produce images of nature different than the images produced in Western primatology.

Part Three of the book: "The politics of Being Female: Primatology is a Genre of Feminist Theory" features the research of four women primatologists: Jeanne Altmann, Linda Fedigan, Adrienne Zihlman, and Sarah Blaffer Hrdy. According to Haraway, these women and others have changed the field of primatology. The change "was not a *natural* result of their sex; it was an *historical* product of their positioning in particular cognitive and political structures of science, race, and gender" (303). Each part of the book depicts a particular time in history, but it is less a chronological documentation of "facts" than a history of science with an emphasis on social theory.

Haraway's Four Analytical Approaches

Haraway incorporates four analytical approaches or, as she prefers to call them, "temptations" in order to answer the above questions. Haraway calls them temptations because all four approaches are persuasive; if only one approach were to be used, it would create a false image of the story she is trying to tell. The first of her approaches comes from the tendency of the social studies of science to reject "epistemological realism" and examine scientific practice as socially constructed (i.e. she draws on the work of Bruno Latour and Steve Woolgar, p. 6). Scientists' versions of analysis are comparable to ethnographic data and are open to cultural analysis in social constructionist perspective. Bruno Latour and Steve Woolgar enunciate this perspective in *Laboratory Life* (1979) where they ask: What is the nature of scientific discourse? What are scientists' interpretive methods? How do scientists attribute meaning to the social world and construct social order? (Mulkay 1985). Latour and Woolgar are talking about the social construction of scientific discovery. Haraway does not want to fall prey to an extreme external account of science. For Haraway, Latour and Woolgar's perspective alone cannot provide her with an adequate analytical approach, for it dismisses the idea that scientific inquiry is not only a social process but a discovery process.

Her second approach comes from one branch of the Marxist tradition which holds that "wage labor, sexual and reproductive appropriation, and racial hegemony are structured aspects of the human social world" (6). Haraway argues that "there is no doubt that they affect knowledge systematically, but it is not clear precisely how they relate to knowledge about the feeding patterns of patas monkeys" (7). So she refers to another aspect of the Marxist tradition, or more specifically, to the scientists associated with the *Radical Science Journal* who see science as a labor process "in order to study and change scientific mediation of class domination in the relations of production and reproduction of human life" (8). However, for Haraway, this approach is still not adequate; it does not indicate how science operates or how it might be linked to her three key words: gender, race, and nature.

Her third approach comes from exploring primatologists' claims that scientific knowledge is not only about control and power, but about the real lives of the animals they study. They believe their scientific accounts represent the real world. Haraway's analysis does not want to dismiss this. That is, her analysis is not only about how science is socially constructed and structured by race, gender, or domination and hegemony, but about what counts as nature in the minds of the scientists and what it is that they think they discover.

Her last approach intersects with the above three. It comes from looking at race, gender, and science as products of history (see also Haraway 1994). Reference is made to Elizabeth Fee's article called "Critiques of Modern Science: The Relationship of Feminism to Other Radical Epistemologies" (1986). In this article, Fee elucidates the two things scholarship about women and science has attempted to do: 1) unmask the masculine bias in science, its "methods", "theories", "facts", "interpretations" and "epistemological assumptions"; 2) search for a different set of assumptions because whenever men and women are compared, dualisms such as culture and nature, and activity and passivity, appear. Fee also writes about how scientists see themselves as impersonal authorities and objective interpreters of the real world, as does Haraway. According to Fee, scientific culture exhibits an absolute view of scientific truth that can at times be oblivious to the ambiguity and historical relativity of scientific knowledge (Fee, 1986: 43).

Haraway attempts to incorporate these points into her analysis. She wishes to unmask the masculine bias in science, its methods, theories, facts, interpretations, and epistemological assumptions, and she wants "to find a concept for telling a history that does not itself depend on the dualism between active and passive, culture and nature, human and animal, social and natural" (7). She sees dualisms as inadequate metaphors for describing primatology; instead, Haraway explores the traffic between Western conceptions of nature and culture. Interactive relationships between subjects and objects of knowledge, and non-binary modes of knowing are privileged (Haraway, 1989). Thus, Haraway incorporates four analytical approaches. She makes use of concepts from feminist empiricism, standpoint, and postmodern feminist theories, as well as critical theory and cultural studies. The remainder of this chapter will discuss her approach amidst feminist critiques of science

Haraway's Academic Milieu

Haraway's book comes as no surprise if the reader is familiar with her previous and related works: "Situated Knowledge" (1988), "Primatology is Politics by Other Means" (1986), "The Contests for Primate Nature: Daughters of Man-the Hunter in the field, 1960-1980" (1984), "The High Cost of Information in Post-World War Evolutionary Biology: Ergonomics, Semiotics, and the Sociobiology of Communication Systems" (1981), "Animal Sociology and a Natural Economy of the Body Politic, Part 1: A Political Physiology of Dominance" and "Animal Sociology and a Natural Economy of the Body Politic, Part II: The Past is the Contested Zone: Human Nature and Theories of Production and Reproduction in Primate Behavior Studies" (1978). Haraway writes about feminism, science, technology, and the politics of biology within feminist theory, and she teaches the history of science, woman's studies, and feminist theory.

Haraway received her Ph.D. in Biology (interdisciplinary program in the history of science, philosophy, and biology) from Yale. She taught at the University of Hawaii from 1970-1974 where she founded the Woman's Study Program. From 1974-1980, Haraway taught in the History of Science Department at John Hopkins. She is currently a professor in the History of Consciousness Department (Interdisciplinary humanities doctoral program) at the University of Santa Cruz.

Primate Visions began to germinate in 1978. Colleagues, students and friends at John Hopkins, the Université de Montreal, and the University of California (Critical Study of Discourse, the Feminist Studies Organized Research Activity, and the Women's Study Program) have assisted with this project in various ways. A number of primatologists and scientists who work in relation to feminist studies have also assisted.

Haraway writes for scientific historians, cultural theorists, "broad left anti-racists", "anti-colonial women's movements", and "lovers of serious stories". She writes about primates because "they are popular, important, marvelously varied, and controversial" (3). Indeed, primatology is a ripe field for analysis. First of all, women working in the field of primatology are growing in numbers (Haraway 1989: 249-295, Fedigan 1995) and are becoming increasingly eminent. Secondly, as Haraway points out (and as Geertz 1990 also notes) the study of primatology, begun in the 1920s and 30s, has a discernible history suitable for analysis.[6] Thirdly, for evolutionists, monkeys' and apes' genetic and social lives parallel that of humans', and seem to tell them a little bit about where humans come from. Evolutionary theories in primatology have become increasingly contested for what counts as sex, gender, nature and culture. Fourthly, field primatology is often linked to adventure and controversy.

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[6] Histories of the field of primatology are recent and few in number (e.g. Haraway, 1989; Sperling, 1991). Shirley Strum and Linda Fedigan's (1996) history of primatology is useful for a brief overview. Primatology, like its sister disciplines zoology and biology, is characterized by its attempts to minimize observer bias. These attempts have been made within a number of frameworks. For example, between 1965-1975 scientific questions in primatology revolved around ecological and environmental concerns, and in this period, primatologists focused extensively on groups of males because they were more important than individual primates.

Between 1975 and 1985, sociobiology was the predominant framework. The individual primate, rather than the group, became important, and the answers to questions posed in the ecological period began to change for many reasons. For one thing, many terms borrowed from economics were used to explain behavior; "kinship selection" and "reciprocal altruism" are good examples. Additionally, long term studies and the study of new species characterized the period. While sociobiology reigned for a number of years, sociobiological theory sparked controversy within feminist circles because it was considered sexist. One prominent sociobiologist, Sarah Blaffer Hrdy, who also considers herself a feminist, did not find sociobiology inherently sexist (e.g. Hrdy, 1986). Her work created an intellectual tension because she called herself a feminist sociobiologist, an oxymoron in sociobiological and primatological circles.

Between 1985-1995 behavioral ecology and social cognition became dominant paradigms (Strum and Fedigan, 1996). Sociobiology was considered too reductionist. More holistic and multicausal studies were conducted, and questions concerned both ultimate and proximate mechanisms. According to Strum and Fedigan, Sperling (1991), and Haraway (1989), women have played a role in building a new image of primates and primates society, especially in this period. The role of hierarchy and dominance came into question, whereas in earlier periods it had not. While these histories show how women, particularly those who are sensitive to gender issues, began to play a strong role in changing descriptions of primate society, it is difficult to pinpoint how and to what extent they have had an influence. Many other external factors may have been involved. Nevertheless, some scholars have tried to quantify the influence of women. The notion of empathy amongst women, for example, and its effects on observer - observed relations has been taken up by Rowell (1984) and Hrdy (1986). It has also been suggested that women ask different kinds of questions than men (Haraway, 1989) and that primatology is a feminist science (Fedigan, 1995). While women have influenced the development of primatology, it is still a discourse predominantly characterized by a presumption that politics and subjective methodologies, such as empathy, should not over-ride "real" scientific work.

The Field of Science Studies

Before discussing what the feminist critique of science is, it will be useful to give a brief overview of the general field of science studies from which the feminist critique of science emerged. Science studies, a relatively new subdiscipline in the fields of anthropology, sociology, psychology, and the history and philosophy of science, focuses on what counts as scientific knowledge. It is not a monolithic field; a plethora of perspectives exists and consequently varying types of explanatory problems and questions.

Science studies used to focus on the demarcation between science and other forms of knowledge (e.g., Popper 1963 and also see Woolgar 1988b). These early studies focused on scientists' ability to tap into how the world really works by studying nature or the physical world, that which is unaffected by human activity. The status of nature was that it was something *out there*. Durkheim (1912), Kuhn (1962) and Feyerabend (1978) secured anthropological, sociological, and historical frameworks respectively for the study of science, whereby the social world is important for an understanding of the physical world, but Durkheim and Kuhn ultimately found that science was transcendent over any other form of knowledge because it best described nature (Woolgar 1988b). Durkheim's notion that there is a correspondence between the social and physical worlds gained popularity, in the last two decades, in response to science studies practitioners' focus on overt realism in science. Durkheim's correspondence between the social and physical worlds suggests that we can understand the schematicization of knowledge about the physical world in the same way we understand the social world (e.g., Barnes 1982; Bloor 1982; Bloor 1983; Latour and Woolgar 1979; Traweek 1988).

Many approaches borrowed Durkheim's notion to arrive at their own. The strong program, for example, (see Barnes 1974) advocates that scientific beliefs depend on their context, and that external conditions (not "intrinsic properties") determine beliefs (Longino 1990: 10) The social constructionist approach (Latour and Woolgar 1979) argues that "scientific activity comprises the construction and sustenance of fictional accounts which are sometimes transformed into stabilized objects" (Latour and Woolgar 1979: 235). The social constructionist approach also encourages us to reject "our obsession with the truth and representation" and to take "scientific theories and hypotheses to be products of their political, economic, and cultural milieu" (Longino, 1990: 9). Nature was no longer seen as something out there but as almost completely socially constructed. Although Haraway borrows from Latour and Woolgar's social constructionist approach above (*Laboratory Life* 1979), she rejects what she considers extreme social constructionism. Haraway believes that "science somehow works" (Stephens 1994: 74).

The discourse analysis school of Michael Mulkay and Nigel Gilbert (Gilbert and Mulkay 1983 and see Malcolm Ashmore 1989) began similarly with the assumption that scientists' discourse is highly inconstant and is reliant on its context (Mulkay, Potter, and Yearly 1983: 196). This school's idea of discourse analysis temporarily cast aside the processes of describing what science is like via scientists' discourse (Mulkay, Potter and Yearly 1983: 196), and of estimating how the changing social context affects scientists' practices. The discourse itself became the subject of investigation. In addition, this school was concerned with interpretation and methodology used to study scientists' discourse (Mulkay, Potter and Yearly 1983). Whether the scientists' descriptions were constructions of the physical world or reflections of the physical world was not always relevant.

More recent studies of science have adopted the notion that neither social constructions of the physical world nor scientific representations of the physical world are transcendent representations of reality. Some scholars would say that this idea characterizes the epistemology of science studies today.[7] In fact, Latour (1990: 169) says that we should grant "transcendence" to neither nature nor society, and we should not deal with the two as if one reflected the other. Reflecting the postmodern insistence that we should not look for authorization in larger collectives or grand narratives, such as gender issues or power issues (see Berreby 1994), Latour says that "collective things" should not be treated as transcendental.[8] Latour recognizes the circularity in treating collectives as transcendental by further saying that we should not treat "social facts like things" because "'things' are already collective facts in the first place" (169). Unlike Latour however, Haraway gives gender and power issues central importance in her analysis.

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[7] Pickering (1992) and Franklin (1995) are good, recent examples of science studies.

[8] Some might argue that Latour also treats certain issues more important than others, thus succumbing to grand narratives. Indeed, Latour does not consider himself to be postmodernist.

Feminist Critiques of Science

Sex, Gender, Nature, and Science

Some feminist critics of science have willingly situated themselves in a different position than that of the critics above. They do not simply want to describe science or say that it is socially and contextually specific without saying something about what is right or wrong about the way science operates or about how reality is described. That is, for the most part, this group of feminists harbor a political position that condemns androcentricism.

The feminist critique of science is varied and therefore difficult to define; however, Sue Rosser (1987) and Nancy Tuana (1987) provide us with the kinds of questions and issues some feminist critics raise. Do women practice science differently than men? (see Longino 1987) Can there be such a thing as a feminine science? Is science considered a masculine endeavor in Western culture? Do we need to broaden our definition of science? Can experience count as knowledge? Can there be a feminist method of science (see Harding 1987)? If women practice science differently from men or use a different approach than men, does this influence their theory? Can there be a feminist theory of science? Can there be a theory for feminist science? Or, more generally, does gender influence the methods and theories of science? Aside from understanding what makes a method or theory feminist, a much newer but less explored issue of inquiry is how the feminist critique of science, with its focus on gender issues, has been received. Hammonds notes that it has not been received well. Hammonds (in Longino and Hammonds 1990) suggests that the reason why the feminist critique of science has not been well received is the conflict over the "interpretations of the meanings of 'gender', 'feminism', and 'science'" (177).

More specifically, one central conflict is over the meaning of sex/nature and gender/culture. For instance, Rosser (1987) has suggested that there are feminists who believe women have preferred biologically determined traits which should be valued, while on the other hand, other feminists play down biological differences, emphasizing the social construction of gender. Sometimes the social construction of gender is not used to play down but to emphasize differences between men and women brought about through different socialization practices and historical circumstances.[9] For example, according to Rosser (1987), Haraway (1989) and Fedigan and Fedigan, (1989), historical status and socialization differences between men and women may provide some women with a perspective different from that of the dominant culture. For Rosser, this perspective leads to a distinct feminist perspective. The idea that women can have a different viewpoint from that of the dominant culture because of their historical status raises particular questions, such as their relation to nature or the physical world, and whether these qualities are universal (biologically or historically determined) for women. For example, primatologist Thelma Rowell (1984) suggests that women have the ability to empathize with non-human primates. Are certain qualities, such as empathy, distinct only to women scientists? More broadly, are women better able to connect with the physical world?

There has been a long-standing controversy in anthropology concerning women and their relation to nature. In a classic article about the association of women with nature in ethnographic descriptions of cultures, Sherry Ortner (1974) argued that women are identified with nature because of their physiology, social roles, and psyches, and that in every culture nature is devalued. MacCormack (1980 and see Hekman 1990: 118), not satisfied with this argument, showed that the association between women and nature and between nature and inferiority is not universal, but also acknowledged that Ortner ultimately concluded that women's roles intercede between nature and culture. The ethnographic literature, for example, suggests that women's roles move between nature and culture, and Ardner (1975 as cited in MacCormack 1980) noted that the Bakanese people utilize metaphors to show this.

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[9] Three outstanding scientific definitions of women's nature are succinctly defined by Schiebinger (1987): differences based on biology; gender differences due to different socialization practices and historical circumstances; differences which may be biological or culturally reinforced (e.g., training in the scientific method).

Haraway points to the ways in which nature and women have been associated in the past. For example according to Haraway, *National Geographic* became a symbol of how communication and the focus on female's connection to nature can be found at the "origin of Western Capitalism" (136). Women such as Dian Fossey and Jane Goodall are portrayed by *National Geographic* as touching beings rather than shooting or hunting beings, as Carl Ackeley was portrayed. Using De Waal's *Chimpanzee Politics* as an example, Haraway shows how females are perceived as irrational, while males are seen as rational (147). Referring to Sherry Ortner (1974) Haraway describes a parallel association in primatology: women are seen as being closer to nature and as able to relate to primates more easily than men. In racial terms, primitives are seen as closer to nature than white people, yet Africans' contributions are ignored in the literature. Women's efforts are considered biologically determined, rather than politically or historically determined (151). On the other hand, man was not "seen,"; he was not part of nature. Nature itself was depicted as something that is innocent, without technology, linked to gender: "she is imagined to be without technology."

Haraway has criticized the idea that women are closer to the physical world because, either biologically or culturally speaking, they are predisposed to better empathize with nature; this is just the opposite of objectivity (1989). Haraway points out that primatologist Shirley Strum was reluctant to let *National Geographic* portray her as someone who favours motherhood at the expense of other important findings, such as baboon social agency and social characteristics. Haraway believes that universally characterizing women this way ignores differences between women.

Much of *Primate Visions* shows how sex, gender, nature and culture construct each other, but not in equal ways, because these constructions are related by "hierarchical appropriation" (12). That is, the meaning of gender/culture has often been defined by what is considered the meaning of sex/nature by using, for example, the existence of biological differences as proof of the limits of one particular sex, most often the female sex. For Haraway, sex is not the same as gender, nor is nature the same as culture. Haraway points out that nature and culture are discussed as if they are independent from history, and "exclude a reader's consciousness of mediation, history, and construction" (146), which show that men as well as women are associated with nature.

Haraway puts a spin on how primatology usually works with dualisms such as nature/culture and sex/gender (10), thus disrupting the way women are connected to nature, via simian orientalism:

> Simian Orientalism means that Western primatology has been about the construction of the self from the raw material of the other, the appropriation of nature in the production of culture, the ripening of the human from the soil of the animal, the clarity of white from the obscurity of color, the issue of man from the body of the women, the elaboration of gender from the resource of sex, the emergence of the mind by the activation of the body (11).

Thus, Haraway pays close attention to the conflict over sex/nature and gender/culture. Evelyn Fox Keller (1982: 589) pointed out another central conflict over the interpretations of gender, and meanings of science and feminism over a decade ago:

> Is there a conflict between our commitment to feminism and our commitment to science? As both a feminist and a scientist, I am more familiar than I might wish with the nervousness and defensiveness that such a personal response evokes. As scientists, we have very real difficulties in thinking about the kinds of issues that, as feminists, we have been raising. These difficulties may, however, ultimately be productive . . . . What is the relationship between science and feminism? Do these criticisms imply conflict? If they do, how necessary is that conflict?

Keller is addressing the potentially problematic association between feminism as a political movement that seeks emancipation and condemns androcentricism, and science as a discipline wherein political influences taint objectivity. According to Mamenwirth (1986), scientists believe that feminism, as a political movement, endeavors to influence the practice of science, and therefore threatens the impartiality of scientific undertakings. One way feminists accomplish this is by showing that values are necessarily part of science (Longino, 1990). Of course, for those trained in the tradition of the scientific method, this type of political influence on the scientific enterprise needs to be eliminated, rather than emphasized, especially if internal rules of this tradition are to be upheld. Science need not be affiliated with interest groups, with the media, or with anything that would hinder objectivity. Therefore, for these scientists, making women the main focus of investigation, or making gender an analytical category is antithetical to the scientific method. For those trained in the social studies of scientific knowledge, however, personal and political interests have always influenced the scientific enterprise. One such influence uncovered by feminists is the predominance of male scientists working in universities. Another influence came from women scientists who began to challenge dominant enlightenment epistemologies (those epistemologies that espouse major differences between scientific knowledge and other forms of knowledge in dualist terms, such as either objective forms of knowledge or subjective forms of knowledge), because they found that what was once thought to be objective, neutral science, was not so neutral after all. At first glance, Keller's question "Is there a conflict between our commitment to feminism and our commitment to science?" appears to be easy to answer in the dominant enlightenment epistemology. Those scholars with correspondence conceptions of truth respond that "Of course, this presents a conflict!" They believe that although ideology might play a small role in science, it should play no role in scientific inquiry. They also claim that an objective knower can describe a transcendent reality because the knower and the phenomenon under investigation are separate and distinct (Alcoff, 1987). A second glance reveals that the answer is more complicated, especially when the dominant perspective has not been entirely neutral in the first place. According to Keller (1982), issues advanced by feminists create some dilemmas for scientists, yet Keller says that these difficulties may be productive in the end. In *Primate Visions,* Haraway insists that working through these issues is productive for science. Those who find the question under discussion difficult to answer are certainly not a homogenous group (some fight scientific conclusions with more science, some fight science with politics, see for example Mamenwirth 1986), but one might argue that one common goal, the effort to emancipate women, has led these researchers to critique science. For many women who are scientists another common goal would surely be the advancement of science.

Uncovering Bias - Exposing Irresponsible Science

The above conflicts persist today in what some call feminist critiques of science. What does it take for a critique of science to be labeled feminist? One kind of feminist critique has tried to show how science has been used to support racist or sexist projects, revealing experimental biases and flaws (see Bowles 1984; Rosser 1987). These kinds of critiques have raised questions concerning gender and sought to *expose* the inadequacies of racist or sexist thinking which have served only to support the status quo. This kind of critique uncovers androcentricism, discovers anomalies (Harding and Hintikka 1983; Hrdy 1986; Neilsen 1990), takes part in consciousness raising (MacKinnon 1982), and attempts to show how male bias in science is irresponsible. To be sure, Haraway executes this kind of critique in *Primate Visions*, especially in her historical account of primatology before and shortly after World War II.

Haraway uncovers irresponsible science as it is manifested in themes of dominance and control over nature. There are many examples in *Primate Visions.* Haraway shows how the American Museum provided a Western vision of animals and a viewpoint of nature full of mystery. She describes Akeley, the taxidermist who hunted, killed and stuffed a silverback gorilla for the American Museum of Natural History in the hope of evoking the "purity of nature" (Haraway 1989: 27). In doing this, Akeley demonstrated one of the processes by which nature becomes dominated. Ironically, the museum, like Central Park, stands in for nature in the heart of New York. Here nature is used as a resource to comfort visitors, while at the same time it executes its scientific goal of "conservation, preservation, and the production of permanence" (27*)*. Haraway explores how entertainment was interwoven with science, art, hunting, and education with the advent of photography and how nature was depicted as pure and untouched by humans. Indeed, Akeley thought of man as the "enemy" (48).

The theme of control was also present in Robert Yerkes' work. According to Haraway, in Yerkes' chimpanzee laboratory experiments became resources for control. Hunting, dioramas, and photography were replaced with a less subtle means of intervention. According to Haraway, Yerkes perceived that the aim of science, especially studies of the mind and behavior, was to control. Eventually, racism (African trackers who are never granted recognition) and sexism (as depicted by Haraway's description of Mary Jobe Ackeley and Delia Ackeley, Carl Ackeley's first and second wife respectively) became institutionalized (54). Haraway has called science from 1914 to 1940 a "management enterprise" whose division of labour consisted of team cooperation and individual control. Personality differences and "self expression" (69) were part of the management enterprise, though they weren't "denied", they were "managed" (81). According to Haraway, the scientific method was one way that control could be achieved. It consisted of test design, which supposedly made Yerkes' evolutionary naturalism unprejudiced. Interests of the scientists and the agencies funding their projects were presented as "natural", rather than representations of the dominant class.

Clarence Carpenter, a comparative psychologist who set animals loose onto the island Cayo Santiago, establishing the rhesus colony in 1938, was also interested in notions of dominance and control. Carpenter was interested in many questions that impinged more on social activities than Yerkes' questions: "Why do animals live in groups?" (in Haraway 1989: 85) What are the hierarchies for both sexes? What are the sex differences for dominance? From Haraway's perspective, Carpenter, like Yerkes, believed that the notion of control was integral to the answers to these questions. Carpenter's idea of naturalistic studies was to remove certain dominant males and record the effect this had on the group. "The Females were bound to the group by the dominance of males; males were bound to the group by the sexuality of females. Both were bound to each other by a logic of control" (85). Dominance was functional and the process of naturalizing certain behaviors was at work once again.

Post World War II primatology also witnessed the creation of the surrogate mother experiments by Harry Harlow, considered by many to be sadistic and the paragon of experiments where control was key. He tried to show, in the era of women's liberation, that a mother was not needed to take care of an infant. He wrote that "It is cheering, in view of this trend, to realize that the American male is physically endowed with all the really essential equipment to compete with the American female on equal terms in one essential activity: the rearing of infants" (Harlow and Mears 1979: 125 in Haraway 1989: 236). In Haraway's words, women were seen as a threat to men, and they were also seen as "redundant" (236).

Haraway tries to show that the use of methodologies from the human sciences by the biological sciences in the days of Yerkes, Carpenter, and Altmann are hidden behind the mask of positivism following World War II. Positivism is described as the dominant epistemology in this era, where background assumptions are not displayed. Hidden behind positivism's power, certain background assumptions have become so entrenched in their methodologies that they are accepted as a normal part of scientific practice.

On the other hand, Haraway believes that early primatologists cleverly and deliberately joined the methodologies and theories of the social sciences with those of the natural sciences. Haraway believes that Carpenter and Altmann were aware of the role historical circumstances have played in the production of discourse. It is important to note that Haraway does not find fault with the fact that external agendas influenced primatology. In Haraway's words, all knowledge is situated. She does, however, find fault with scholars whose external agendas and biases are irresponsible. Haraway believes that accountability cannot be avoided. Stephens suggests that Haraway also believes that a scientist can be accountable by defining the basis for her/his objectivity (Stephens 1994).

Feminist Empiricism

Some critics have taken the notion of uncovering bias a step further and have argued that male biased science is clearly not objective science. They suggest that the problem with male bias can be corrected if feminists become more objective. This has been labeled by Sandra Harding as feminist empiricism (Harding 1986). In her pathbreaking work (1975 and see also Hekman 1990), Evelyn Reed argues that sociobiology is sexist and points out that male sociobiologists' accounts of life are not objective. By becoming more objective we could alleviate the problem of male bias in scientific practice.

This position has been criticized because it argues that knowledge is not historical (Hekman 1990) and some feminists suggest that instead of trying to eliminate the ideology from science, we should acknowledge its presence (Fausto-Sterling 1985; Hekman 1990; and see also Longino and Doell 1983; Longino 1987; Longino 1990). Furthermore, this brand of feminist empiricism is problematic in the same way earlier science studies were problematic in that it does not question the status of nature as something "out there". It endorses the human/nature dichotomy (see Scott 1990). Those who defend feminist empiricism have argued that critics have misunderstood the relationship between feminism and empiricism, and that critics are incorrect in assuming that some feminists still working within the traditional scientific framework espouse the same meaning of objectivism and positivism as their androcentric colleagues (McCaughey 1993). This misapprehension, McCaughey (1993) believes, lies in the way philosopher Sandra Harding defined science, values, and objectivity. Her tripartite model divides feminist critiques of science into empiricist, standpoint and postmodern critiques. McCaughey suggests that Harding and others have mistakenly assumed that because feminist empiricists do not reject science, they carry with them assumptions that simulate positivism, which does not acknowledge the role of values in science. According to McCaughey, the problem is not necessarily with science but with positivism, which assumes "point of viewlessness" (75), and with the misunderstanding between science and rationality. Although rationality has been in the past connected to men, it is not innately a male or white enterprise, says McCaughey.

Haraway would agree that one kind of feminist epistemology is empirical and rational, and that it challenges the traditional view of objectivism and positivism. Indeed, Haraway still believes that "objectivity" is crucial for science, even though she wishes to define it from a situational perspective (Haraway 1991), and Stephens says that Haraway wants to show that the limits of objectivity need to be addressed (Stephens 1994).

Haraway discusses empiricism in primatology insofar as "quantitative problem-oriented studies accumulated" (124-125). For instance, male bias is replaced by more mature and objective studies. Improved scientific training contributed to the rise of sociobiology and socioecology, according to Haraway. This kind of account of primatology, sees a natural progression of the sciences as a result of more rigorous approaches and better trained scientists and resembles Harding's feminist empiricism. Positivism prevails in this account, and hermeneutical and other critical representations from the social sciences are cast aside (125). Haraway is critical of empiricist accounts that dismiss critical representations.

Standpoint Epistemology

Neilsen (1990), Harding and Hintikka (1983), Rose (1983) and Smith (1990) write from a "standpoint epistemology" where experience is a form of knowledge, and where disadvantaged individuals such as women are privileged to a more inclusive and complete view of the world. This standpoint, as Harding points out in Canadian sociologist Dorothy Smith's work (1981 as cited in Harding 1986), attacks the dualities of enlightenment science: subject-object, reason-emotion, etc. Furthermore, this standpoint argues that these should not be seen as dualities, but rather as interconnected concepts. In this sense, there is no longer a distinction between the observer and the phenomena to be observed, and nature does not exist apart from what is known about nature. Science critics who have adopted standpoint epistemology criticize the objectivism in science that does not see experience as a legitimate form of knowledge (Harding and Hintikka, 1983).

Some critics (see Neilsen 1990; Haraway 1988; Harding 1986) of this view raise the following questions: Who are the oppressed? Men? Women? Black women? In other words, these critics object to the idea of a universal standpoint for women. Furthermore, is oppression a necessary ingredient in order to see the world in a certain way? This perspective has been criticized because it does not question the nature of reality. This perspective believes that with a more inclusive point of view the truth really can be discovered (McCaughey, 1993). Hekman (1990 as cited in McCaughey 1993) has suggested that if standpoint theorists reject male centered epistemologies because their view is distorted, then female centered epistemologies should also be condemned. Haraway might respond by saying that the values underlying these epistemologies could be assessed and judged.

Standpoint theories have also been criticized because it is believed that they deny individual differences between women. Haraway would likely disagree with an essentialist standpoint for women, because not all women have the same perspective.

Longino (1989 as cited in McCuaghey 1993) has further criticized the standpoint theorists, saying that they have no external criteria by which to evaluate male epistemologies; the standpoint theorists simply do not like conclusions which are male centered. In this respect, standpoint theory has been criticized because it suggests that women are subjective observers, while men are seen as being objective. Women are thus "outside the realpolitik modern culture" (Keller 1982: 593). The popular assumption is that what has been defined as science over the years, and is primarily practiced by men is objective science. As one colleague asked me, "Is objectivity simply male subjectivity?"

Evelyn Keller's (1985) presentation of the work of geneticist Barbara MacClintock shows how MacClintock sought an intimate understanding of the plants she studied, in other words, a "feeling for the organism." Her practice of science involved intuition, connectedness, relatedness, and feeling. Stephen Jay Gould (as cited in Keller 1987) has claimed that a "feeling for the organism" is not distinct to women, and that all good scientists use this quality, including himself. In acknowledging this, Keller asks an important question. If these qualities, intuition and the like, are not so distinct, why are they repudiated when women use them? These intuitive processes may be part of the "context of discovery" but in Western science these qualities normally have no place in the "context of justification" (see Kaplan in Morrow 1994). Longino (1983; 1990: 4) points out that contextual values in Western science, those social and cultural values that are seen as being outside scientific inquiry, are distinct in theory from constitutive values, those values that are accepted in and constitutive of scientific inquiry. Keller's question raises the possibility of using social scientific methodologies to investigate the physical world. She also questions the notion of objectivity as defined in Western science and calls for a "dynamic objectivity" which "aims at a form of knowledge that grants to the world around us its independent integrity but does so in a way that remains cognizant of, indeed relies on, our connectivity with that world" (Keller 1985: 117 and see also Heldke 1987).

Haraway, similarly, suggests that a scientific approach should define its basis for objectivity (see Stephens 1994) because knowledge is situated. In this sense, by defining where you "see" is a standpoint, but Haraway would argue that there are many standpoints.

Challenging the Power Behind Science

Another kind of feminist critique of science criticizes science itself, rather than simply the components of science. Longino (in Longino and Hammonds 1990) suggests that Anne Fausto-Sterling's work demonstrates male bias in science, but it does not critique science itself: "science is still master and when ripping apart the master's house, one cannot use the master's tools" (Audre Lorde in Longino and Hammonds, 1990: 167). This critique has attacked the power structures prevalent in science. The post-structuralist theorist Joan Scott (1988) examines power structures in the discourses of science, which are contained in institutions. Ruth Bleier (1984) has insisted that

> While [a scientific] discourse appears to be uncovering the truth, it rests upon and conceals the struggle between those who have the power to the discourse and those who do not. Both by their practices of exclusion and their definitions of what is (what is to be discussed, what is false or true) discourses produce rather than reveal the truth (1984: 79).

Schiebinger suggests that achieving neutrality in science is impossible: " scientific knowledge cannot be neutral because it is structured by power relations" (1987: 30). This sort of critique clamors for a feminist epistemology (see Rose 1986), even though many have questioned the possibility of this ever happening (e.g., Hesse 1994; Longino 1987, 1994). While an essentialist feminist epistemology is frowned upon by Haraway, she does look at power relations from many angles, especially when she exposes the different levels of partiality. Haraway draws on philosopher Michele Foucault to show that power relations between men and women, between different races, and between competing knowledge claims in capitalist society influence the way knowledge is produced.

Epistemology and Feminism

Another way of characterizing the feminist critique of science or, more generally, of knowledge is not so much about *what* is critiqued, but is about the epistemological character of knowledge itself. For instance, Neilsen (1990) borrows from the hermeneutic tradition and critical theory to show that the scientific method is not so distinguishable from other ways of knowing. She says that values are necessarily part of scientific inquiry and that people other than scientists use inductive and deductive reasoning (Neilsen 1990: 4). The interpretive tradition is critical of objectivism and of the scientism of the white male tradition (Bowles 1984). Yet, Neilsen proposes, for instance, that a *feminist method* can be identified within an "older positivist-empirical tradition" and within a "newer postempirical" one (Neilsen 1990: 1), while others have suggested that the search for a *feminist method* is futile (Harding 1986).

Poststructuralist, postmodernist, and critical theories with a feminist orientation deal with the epistemological character of knowledge itself.

Poststructuralist Theory

Poststructuralist theories grew from dissatisfaction with established intellectual classifications. These theories sought to include subjects who were seen to be active agents and to weaken any theory, such as positivism, that claimed universality. Language plays a significant role in the formation of meaning, where "discourse", "text", and "reading" are key concepts (Childers and Hentzi, 1995: 238). Many feminists have used poststructuralist theories. For example, Joan Wallah Scott (1988a) has taken poststructualist theory as defined by Jacques Derrida and Michel Foucault to arrive at a theory for feminism in order to "deconstruct" dualisms, such as objective and subjective, and to show that they should not be seen as such. She suggests that texts have to be analyzed in terms of historical and contextual meanings, which are continuously changing. Drawing on Foucault, she illustrates how these meanings have changed in institutionally specific statements and beliefs, or structures, and shows that these changes involve power. She also uses Ferdinanad de Saussure's notion of structural linguistics to illustrate that the meaning of language is made through contrasts by looking for oppositions and negations. Lastly, Scott reverses, as well as displaces, binary polarization. In this sense, deconstruction can be put to use if feminists are interested in being critical of the way concepts are normally expressed.

Haraway does not label her work as poststructuralist, even though it shows how some women primatologists disrupt modernist and positivist accounts of primate life. Haraway writes about how Jeanne Altmann, a mathematician turned primatologist, disrupted modernist and positivist accounts of the primate world by writing a paper on sampling methods that questioned how data are collected; Linda Fedigan showed how some behaviors may not be adaptive, thus denunciating the naturalization of certain behaviors; Adrienne Zihlman, the paleoanthropologist, refused to interpret the differences in two sets of bones of proto-humans after saying that the differences were not due to sexual dimorphism, but rather the bones were from different species altogether. Finally, Hrdy, the sociobiologist, single-handedly turned around the way female primates were portrayed in sociobiological models.

Dorrine Kondo (1990: 37), an anthropologist, has noted that is difficult to avoid using dualisms when describing social life. While Haraway does try to disrupt dualisms, some might argue that she nevertheless remains entrenched in them.

Postmodernist Theory

Postmodernism has been defined in many different ways, and continues to be a term that causes considerable confusion (especially for feminists see e.g., Nicholson 1990). Nevertheless, some postmodern feminists (Susan Hekman 1990; McCaughey 1993), have used the term to mean that they are critical of enlightenment epistemology, or claims to universality. They believe that working within the modernist epistemology does not help them adequately address gender concerns because it is too entrenched in traditional ways of thinking. Harding in the past (1986) has labeled Haraway as a postmodernist, as have others such as Susan Hekman and McCaughey, yet Haraway herself does not use this term to describe her work[10] Bruno Latour (1992) has noted that Haraway's work is often confusing because she is postmodernist *and* modernist and that "the two . . . modes interfere constantly with her insights" (502).

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[10] McCaughey (1993) has tried to show how Haraway is a postmodernist and how her framework can work. By drawing on the work of Donna Haraway and, feminist philosopher, Helen Longino, McCaughey believes that a postmodern framework for feminists and scientists can be achieved that does not jeopardize either of these two groups' underlying assumptions. In doing so, McCaughey tries to show how postmodernists can judge claims, and are therefore not relativists, and how although postmodernism denies that there is a transcendental subject, it is still useful for feminists. Derrida, for instance, calls for deconstruction that focuses on "intervention" (Hekman, 1990: 164). For example, McCaughey argues that postmodernist feminists can have standpoints and that feminist scientists can be postmodern. Inspired by Haraway, McCaughey argues that judgment is possible, but not by way of making "absolutist" or "irresponsible" claims. For instance, two arguments can contradict each other if their background assumptions are different, but both arguments may still be rational (79). Claims that are in opposition can be judged in light of their background assumptions as well as in light of rationality. In the words of Helen Longino, data becomes the basis for proof for a hypothesis only when background assumptions are agreed upon (Longino 1990 and McCaughey 1993). When the background assumptions are agreed upon, the enterprise within which the data are judged becomes hard to criticize because it becomes normalized. Objectivity is not considered a tool that can provide an exact picture of the world, but a collective scientific method with background assumptions. A method is objective if it allows "transformative criticism" (Longino 1990: 76 as cited in McCaughy, 1993), and "since intellectual authority is not equally shared, the scientific community will not respond to everyone's criticism and to this extent a scientific community will not meet its goal of objectivity" (McCaughey, 1993: 80). Scientists can be feminists because "knowledge claims are discourse informed by perspective" (McCaughey, 1993:82). McCaughey tries to show

Postmodernists have been criticized on a number of levels. Examining these criticisms can help us see where Haraway fits into the postmodern pastiche. First of all, postmodernism rejects the epistemology of subjects which means that gender cannot be considered a subject (Di Stefano as cited in Harding 1990a). Because of this women cannot overcome marginalization when there is no such thing as a subject (Hartsock 1987). Second, postmodernism is not useful as a tool for political action and emancipation because it rejects standpoints and resists making judgments and knowledge claims (see Hartsock, 1987 in Harding 1990a). In this respect, postmodernism has often been associated with relativism, which denies that any knowledge claims can be made because everything is socially constructed. Because it denies subject and knowledge claims, postmodernism is seen as problematic for feminists.

On the other hand, postmodernism is sometimes considered appealing because it emphasizes multiple points of view where many voices are expressed, rather than one correct view. Although Haraway seems to be well aware of the criticisms of postmodernism, she does seem to find aspects, such as the concepts of "plurality" and multiple points of view intriguing. For example, Part II of her book begins with Frederick Wiseman's radical documentary called *Primate* (1974). This film is about "the structure of observation, about how to produce knowledge, and daily practice in a scientific

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in what Haraway is postmodern and how postmodernism is useful for feminism. Some scholars, however, would not agree with McCuaghey's interpretation of Haraway as fully postmodernist (e.g., Latour 1992). Furthermore, many feminists still believe that postmodernism is problematic for feminists (see for e.g., papers in Nicholson (ed.) 1990, and Fraser and Nicholson 1990).

laboratory, about objectivity, and about alienation" (117). Haraway draws on this film to show a "multiplicity of visions" (118) and "compulsory reproductive heterosexuality" (119). For Haraway, it seems to be a paragon of a postmodern description of the production of knowledge. International science is introduced in this section as well as Alison Jolly's skepticism over heroic hunting stories about early protohominids. It is also in this section that Haraway introduces some of the reactions to earlier stories about non-human primates and their indirect connection to instructing the way humans should behave.

Haraway believes in multiple standpoints, a postmodern move, but shies away from the relativistic inclination of postmodernism by making strong knowledge claims; she claims that there *is* partiality in the sciences, and that the meaning of objectivity needs to be changed.

Haraway deals with the problem of relativism (in its most extreme form - the denial of making knowledge claims) throughout *Primate Visions*. One way that Haraway deals with this problem is by showing that there are no simple definitions of nature, science, fact, or fiction. Complexity does not mean relativism. Haraway is interested in conducting, in part, a semiotic analysis which explores texts for the production of meanings, in her case, the meaning of nature, sex, and gender amongst segments of a culture. Haraway explores the meaning of nature by exploring clashing, or in Haraway's words, "contending" scientific discourses in the construction of the meaning of nature. Focusing on where meanings come from, Haraway concentrates not only on scientific versions of non-human primate life, but also on popular culture portrayals of non-human primates. The King Kong movie of 1933 and Hallmark's greeting card called "Getting Even", which depicts a giant Marylyn Monroe-like goddess reaching over about to pull the blanket over the miniature, shy and embarrassed Kong, are symbols of "racial and gender codes". Haraway says that the card reverses the "semiotic values" from "feminized woman" and "savage beast" to the "feminized black man" and the "savage female beast" (see 161-162).

According to Haraway, scientific and popular culture also provide the kinds of discourses which show how fact and fiction are similarly constructed and how each defines the other. She shows how "fiction can be true and is known to be true by an appeal to nature" (3). Humans create scientific narratives and although both "fact and fiction are rooted in an epistemology that appeals to nature" (4), they are not exactly the same thing. While Haraway insists that fact and fiction are both embedded in storytelling practices that are dedicated to progress, she points out that the natural sciences try to distinguish between the two. I think it is here, with Haraway's use of the word "storytelling", that some readers might begin to dismiss her work. Perhaps in anticipation of this alarm, Haraway warns, "But to treat science as narrative is not to be dismissive, quite the contrary" (5).

> But these observations about predictable claims and social needs do not reduce natural science to a cynical 'relativism' with no standards beyond arbitrary power. Nor does my argument claim there is no world for which people struggle to give an account, no reference in the system of signs and productions of meanings, no progress in building better accounts within traditions of practice. That would be to reduce a complex field to one pole of precisely the dualisms under analysis, the one designated as ideal to some impossible material, appearance to some forbidden real (12).

She also adds: "But neither is it to be mystified and worshipful in the face of a past participle. I am interested in the narratives of scientific fact - those potent fictions of science - within a complex field indicated by the signifier SF" (5)

Another way that Haraway seems to avoid relativism is by grounding her arguments. Because the natural sciences espouse certain values, they can be criticized at the level of 'facts' and 'values'. So, science is less a matter of being biased than a matter of being defined by values for "only the pose of disinterested objectivity makes 'concrete objectivity' impossible" (13). For Haraway, "The detached eye of science is an ideological fiction that hides - and is designed to hide - how the powerful discourses of the natural sciences really work. One grating consequence of my argument is that the natural sciences are subject to criticism on the level of 'values,' not just 'facts' " (13). By looking at values instead of just facts, Haraway engages in social criticism, not only at the level of local scientific practice, but at the level of larger social systems, namely gender bias. Here she cannot avoid making grand epistemological claims. In this sense, she is not postmodern.

Another way that Haraway seems to avoid the pitfalls of relativism is by her effort to redefine objectivity (e.g., see also Bhavnani 1993; Prims 1995), without sacrificing scientific authority. Her definition does not pit value neutrality against ideology-laden science (see Hekman 1990: 128-135 for a good discussion). Haraway (1988) writes about "situated knowledge", partial perspectives, locatable and critical knowledge, and how "relativism is the perfect mirror twin of totalization in the ideologies of objectivity. Both deny stakes in location, embodiment, and partial perspective; both make it impossible to see well" (Haraway 1988: 584). In other words, Haraway does not regard science as the true representation of reality or of nature, but nor does she regard it as simply ideology (Longino and Hammonds 1990). As Longino (in Longino and Hammonds 1990) says, Haraway is not saying that "anything goes" (174); she is not a "simple relativist" or anti-realist (171); she does believe that science is "rule-governed", but that in representations which follow the rules it is "possible to interact with our material surroundings in reliable ways" (174).

In her introductory chapter, Haraway states several times her feelings about relativism: "To cast science as narrative is not to be dismissive, quite the contrary" (Haraway, 1989: 5), and "these observations about predictable claims and social needs do not reduce natural sciences to a cynical 'relativism' with no standards beyond arbitrary power. Nor does my argument claim that there is no world for which people struggle to give an account, no referent in the system of signs and productions of meanings, no progress in building better accounts within traditions of practice" (12). Finally, " To insist on value and story-ladenness at the heart of the production of scientific knowledge is not equivalent to standing nowhere talking about nothing but one's biases - quite the opposite. Only the pose of disinterested objectivity makes 'concrete objectivity' impossible" (13). Contrary to what some scientists might think, Longino (in Longino and Hammonds, 1990) suggests that Haraway is not trying to recruit scientists to an alternative scientific practice. Like the well known critic of science, Bruno Latour, and the well known primatologist Shirley Strum (Latour and Strum 1986), Haraway seems to suggest that self-awareness and self-reflection can improve the way science is practiced.

In sum, Haraway objects to the notion of a unique women's perspective because this would suggest universality (Haraway 1988 and see Hekman 1990) and would deny that knowledge is historically situated. For the same reason, she would also object to the idea of a female successor science that completely replaces masculine science (Longino in Longino and Hammonds 1990). She proposes the notion that there are many kinds of realities; however, some accounts of reality, the ones developed by women and adhered to now by both men and women, are more responsible representations of historically situated knowledge. Haraway does seem to make knowledge claims, but attempts to avoid making ones that are universal. Although Haraway makes references to postmodernism in her discussion of sociobiologist Sarah Blaffer Hrdy and throughout her book, she never directly labels herself as one. In fact, in a 1995 publication, she says that her work draws on cultural studies (where critical theory is integral), feminist theory, and science studies, and she uses the metaphor of "vision" and the idea of "situated knowledge". Let us now take a closer look at how critical theory is integral to her metaphor of "vision" and situated knowledge.

Cultural Studies and Critical Theory

Haraway's perspective can best be described as cultural studies intertwined with feminist theory and critical theory. Cultural studies is "dedicated to the notion that the study of cultural processes, and especially of popular culture, is important, complex and both theoretically and politically rewarding" (Turner, 1992). It is defined by several characteristics: The analysis of texts, media, language, and their meanings; the study of cultural reproduction; the study of signs (semiotics); the study of ideology; and the study of hegemony. Italian theorist Antonio Gramsci's theory of hegemony can be defined as cultural domination or leadership which "is not achieved by force or coercion, but is secured through the consent of those it will ultimately subordinate. The subordinated groups consent because they are convinced that this will serve their interests; they accept as 'common sense' the view of the world offered them by the dominant group" (Turner, 1992:67). As we have seen in a number of examples, Haraway analyzes the meaning of primatological texts and media where primates are featured. Although Haraway does not make any references to hegemony in *Primate Visions*, she uses theories of hegemony in more recent publications (e.g., 1994).

Critical theory is used to signify a critical outlook on social life and is a critique of ideology.[11] Its perspective originated in the "Frankfurt school". Jurgen Habermas is perhaps the most well known critical theorist. Critical theory has been criticized for its essentialist tendencies. Like feminist critics of sociobiology (e.g. Fedigan 1986 and Hrdy 1986) who argue that sociobiology is not inherently sexist, critical theorists have pointed out that while Habermas's version of critical theory ignores the role of women (e.g. Meisenhelder 1989[12]) it is "the most advanced philosophy of our time" (Mills 1987: xi). Many believe that there is potential within this philosophy for a feminist critical theory (see Love, 1987 as cited in Hekman 1990; Marshal 1991; Fraser 1985; Benhabib 1990). Critical theorists, including Donna Haraway, see the benefit in this philosophy because it rejects the polarization between objectivism and subjectivism (e.g. Haraway 1995), grants agency to subjects under study, and is critical of positivism, where observation shows that "phenomena do or do not fit a theory" (Abercrombie 1988:190), while retaining some forms of enlightenment epistemology, such as striving to analyze social reality (Morrow, 1994). Unlike the purpose of many postmodern theories, critical theory does not necessarily resist grand epistemological claims. Furthermore, it is critical theorists' belief that some epistemologies endorse the beliefs of the powerful (Harding 1990a). For example, Habermas argued that technical rationality is a way of controlling society (Abercrombie *et al* 1988: 190). Critical theorists in general believe that emancipation for disadvantaged groups of people is possible and that logical knowledge can be achieved through open dialogue and communication (Abercrombie *et al* 1988). Haraway's metaphor of vision "as a way to resurrect an epistemology of objectivity gives us interdisciplinary studies and multiculturalism writ at large, but it also claims to offer moral criteria for distinguishing between better and worse modes of seeing. Not all knowledge is equal" (Grassie 1996). Her vision is more clearly explained in a 1991 publication than in *Primate Visions*, although she does begin to formulate it here, hence the word "visions" in her title. Knowing is all about vision. Haraway urges for a self reflexive science, where conversation is crucial (Haraway 1991). In a 1994 publication (five years after *Primate*

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[11] For a more in depth and thorough discussion refer to Morrow 1991.

[12] Meisenhelder (1989) disapproves of the Habermas description of reason and how it is "devoid of emotionality" (1989: 121). Meisenhelder criticizes those who do not value emotions and see them as inferior to rationality. He suggests that this degrades women because women are the carriers of emotional reasoning. Citing Daly (1984), he argues that emotions and thus women need to be seen as pert of human reason. I think the better question might be why it is that men's reason is considered rational and superior in the first place and why are women relegated to the emotional and irrational. Soley attempting to give value to the subjective and women is inadequate; rather, understanding why rationality has been linked to males might be appropriate as well.

Visions was published), Haraway defines her position as:

> A set of discourses about the apparatus of bodily/cultural production; emphasis on the irreducible specificity of that apparatus for each entity. Not culture only as symbols and meanings, not comparative culture studies, but culture as an account of the agencies, hegemonies, counter-hegemonies, and unexpected possibilities of bodily construction. Deep debts to Marxism, psychoanalysis, theories of hegemony, communication studies, critical theory of the Frankfurt variety, the political and scholarly cauldron of the Center for Cultural Studies at the University of Birmingham. Relentless attention to the ties of power and embodiment, metaphoricity and facticity location and knowledge. Unconvinced by claims about insuperable natural divides between high and low culture, science and everything else, words and things, theory and practice (Haraway, 1994:67).

As we have seen Haraway uses aspects of postmodern epistemology to avoid an essentialist and totalizing position: "She wants to have robust critical theory but is fearful of the essentialist tendencies in such theories. Haraway accepts Harding's proposition that 'we' need a more robust notion of reality than that afforded by paranoia and cynicism or by desperate lurches of blind faith and will to power" (Grassie 1996: 295).

Feminist Theory Meets Science

In Part III of the book Haraway looks at the intersection between feminist theory and primatology and tries to understand the paradoxical meaning of being a woman and an "object of knowledge" in science, while acknowledging that the study of women and science is different from the study of gender and science (Keller 1985 in Haraway: 287). Being a feminist can be different from being a woman. "All woman's practice is not feminist and man's practice can be feminist" (287). She looks at key women in primatology who reconstructed primatological practice and accounts of monkeys and apes, but contends that these reconstructions were not "a natural result of their sex; it was a historical product of their positioning in particular cognitive and political structures of science, race, and gender" (303)

Haraway is critical of primatologists of an earlier period (pre and post World War II), and uses that work to show how contemporary primatologists reacted. Their reaction formed the basis of contemporary primatology, which intersects with feminist theory. For example, Jane Goodall as an example of "colonial discourses forced into the syntax of post-colonial Africa" is the "story of the young woman alone in the wilderness" (166). Haraway writes "Jane Goodall defined what would count as primate society for the popular audience; the networks reaching out from the much less publicly visible Gombe students have determined what would count as leading-edge science for key audiences, audiences controlling access to critical resources - grants and jobs - for science" (170). Haraway adds: "Goodall had solid scientific authority, but it was an authority embedded in a contentious collective discourse outside the popular eye" (170). The Gombe studies are criticized by Haraway for their lack of focus on female interactions and ecology.

Haraway also scrutinizes the work of Sherwood Washburn. Sherwood Wasburn's "evolutionary functionalism," the "hominizing adaptive complex" linked to bipedalism and tools, and the idea that primate social life is not grounded in sex are discussed by Haraway at great length. She cautions, however, that "sexual difference did ground a fundamental functional adaptive complex, reproductive social relations, which at the human level, had to be structured for creature" (215). Sherwood Washburn, a physical anthropologist, was known primarily for "Man the Hunter". In this model, tools were hunting weapons for "universal man". Haraway says that control, aggression and cooperation provided the foundation for "Man the Hunter".

Soon after, according to Haraway, "universal man" was pushed aside for more individualistic and genetic types of explanation, especially Irven Devore's brand of sociobiology. Richard Lee's work on hunters and gatherers further brought an end to the "Man the Hunter" story. Feminist sociobiologist Sarah Blaffer Hrdy's work on Langurs, and Barbara Smuts' studies of baboons in Africa "retheoriz[ed] what it means to be human by theorizing what it means to be female" (228). Paleoanthropologist Adrienne Zihlman and Nancy Tanner worked on "Woman the Gatherer", another challenge to Washburn's Universal Man.

> Woman the Gatherer appeared as a serious organizing hypothesis within physical anthropology at a moment analogous to early man in Africa's umbilical tie to the United Nations' founding documents on race and human rights. Rooted in the struggles for decolonization and women's liberation, the United Nations Decade for Women began in Mexico City in 1975 and concluded in Nairobi in 1985. This was also the decade in which scientific credentials earned by white western feminists, with the help of funds made available by the space race and the Cold War, allowed them to challenge limited but important aspects of the falsely universal discourses of masculinist life and social sciences. In the international "discovery" of the multiple forms of women's agency and voice, symbolized and enacted in the official and non-governmental meetings of the U.N. Decade for Women and in the array of women's movement's around the world that made the Decade necessary, other imaginations and politics of human ways of life were available to scientific research programs (228).

While many scientists reacted to early versions of primate life, Haraway cautions that not all approaches are adequate. I found that Haraway points out four approaches that could be mistaken as the practice of good feminist primatology:

1. The first approach that can be mistaken for good feminist primatology is one that believes that male-biased science is bad science. Haraway believes that male biased accounts of human origins and of monkeys and apes are not always and necessarily "bad

science". They are not "bad" even though Haraway does not like their conclusions, but she does point out that the persistence of male biased accounts represents much deeper problems in society with respect to the meanings of sex, gender, nature and culture. Recall the claim in her introductory chapter that problems can be found at the level of facts as well as at the level of values or underlying assumptions, especially, since assumptions are embedded in facts. An underlying assumption can be assessed just as a fact can. The problem with the male biased accounts, according to Haraway, is that, historically speaking society has been sexist and this has been incorporated into our ways of thinking.

2. A second approach that can be mistaken for good feminist primatology is one that believes that biases can be easily eliminated. Haraway does not agree with ill founded philosophies of science and ideologies that look for easy answers and thus hinder further exploration into the meanings of sex and gender (290). That is, adopting the idea that male bias exists and that it can be easily corrected may not be realistic. Those who believe that male biased accounts can be corrected easily do not question why they have persisted so long in the first place. In other words, they do not make enough epistemological inquires into the problem of male biased accounts.

3. A third approach that can be mistaken as good feminist primatology is an approach that assumes that male biased accounts can be corrected by attempting to write female biased accounts, such as writing about female primates who can now do everything that male primates do. "Bias" supposedly "cancels bias" (290). For Haraway, this represents a new

oppressive totality that is not science but ideology. According to Haraway, Lancaster's depiction of primate females that do everything males can do is a primary example.

4. The final misleading approach has to do with a biased point of view that is "the social and epistemic operator sex-gender" (290) or the premise that it is easier for female primatologists to identify with female primates because of their sex. Haraway objects to a fundamentalist, essentialist, and universalistic standpoint that claims that one point of view of a particular group allows real phenomena to be knowable. For example, Thelma Rowell's belief that females empathize with female primates does not question the role of the observer in determining what is seen. Furthermore, this idea universalizes identification, and does not question the nature of truth because the use of the methodology called empathy, available to only one particular sex, supposedly allows them to see better. This way of thinking denies differences between women. There is still a truth that can be tapped by virtue of their biological sex and the way they tap into this truth is by being subjective. In Haraway's words, "'other' is appropriated to the explanatory strategy of the writer" (293), empathy is the opposite of objectivity, and becomes a part of the very dualisms that feminists should be trying to dismantle (covert vs. overt, dark vs. light, implicit vs. explicit) (293).

For Haraway, a favourable feminist encounter with science would consist of one or more of these characteristics:

- It contends that sex (or sexual difference) does not explain everything;
- It acknowledges that there are different objects of knowledge or focuses of study;
- It relies less on the dialectic between nature and culture;

- It finds less drama in descriptions of primate life;
- It accepts differences between accounts of primate life; these is no homogenous way of dealing with masculine biased accounts of primate life;
- It agrees that accounts which are reconstructed are reactionary and historically situated where "suspicion" and "irony" are key words;
- It keeps sexual differences in perspective;
- It accepts that both primates' and primatologists' identities are always changing;
- It is critical of acceptability of descriptions;
- It refuses one all encompassing description of what it means to be human, female, or woman;
- It realizes that female and woman have been pivotal "neutral-technical objects of knowledge".

Haraway's epistemological position has not gone without criticism by other feminist critics. As we have already seen, Haraway combines some aspects of postenlightenment epistemology with some aspects of postmodernism. In critiquing Haraway's selective use of postmodernism and feminist theory, Susan Hekman (1990) points out that "this eclecticism . . . is precluded by the radical nature of the postmodern critique" (Hekman 1990: 135). Another criticism is that in foregrounding women scientists, she ignores what Harding (1990b) calls transverse identities or men who actively support women's issues.

Summary Of Haraway's Viewpoints

1. Haraway says that she writes for many audiences, including scientists.

2. Haraway states that she is neither an extreme social constructionist, nor an extreme realist.

3. Gender inequality is an important focus of Haraway's work, and helps her define the meaning of science.

4. Haraway believes that women have contributed to the field of primatology because of their historical positioning in society.

5. There are many different ways that feminism and science interact.

6. Haraway exposes irresponsible science, pays attention to the validity of many points of view, and ultimately stands for situated knowledge.

7. The metaphor of "vision" and multiple points of view plays a key role in Haraway's attempt to avoid being relativistic and in her attempt to avoid being essentialist.

8. While wanting to show the limits of objectivity, Haraway has said that objectivity is important for science.

9. Haraway uses language and rhetoric that "highlights the fact that conventional discourse is totaling and androcentric" (Nuyen 1995: 77).

10. Haraway has said that she does want science to be productive and does want a "better account of the world" (Haraway 1995b: 187).

CHAPTER III

METHODOLOGY

Introduction

Having discussed Haraway's view of science, especially the science of primatology, I am now in a better position to carry out my main objective: I will explore the reception to *Primate Visions* by examining the body of book reviews which were written since 1989. As we saw in Chapter 1, the overwhelming number of reviews and the emotional undercurrents and differing assessments therein suggests that the controversy over the meaning of science still exists. The controversy in general might be characterized as a debate where the meaning of science is being negotiated amongst different scholars. Some have characterized the controversy as a "dialogue of the deaf", a dialogue where the meaning of science is not negotiated, where scholars representing incommensurate "camps" or "viewpoints" talk past one another. Understanding the reactions to Haraway's critique of science and understanding the nature of the debate in its contemporary form is the objective of this thesis.

What kind of methodology would enable me to carry out an investigation of the reviewers' reactions to *Primate Visions*, particularly of their viewpoints on the meaning of science? Clues about how to proceed come from philosopher Michele Foucault (1972, see also Lenoir 1990). He recommends treating the reviews as a corpus. That allows us to anticipate that the reviewers write and speak as members and participants of discourse communities.

Foucault defines discourse as an entity that is "made up of a limited number of statements for which a group of conditions of existence can be defined" (1972: 117). For example, there can be a legal discourse, racist discourse, or medical discourse, each having individual defining conditions. Discourses have a set of anonymous rules (211). These rules are not always apparent because they might be ingrained in the discourse. In this respect, discourse is not simply text because discourse and the context in which it is produced cannot be easily differentiated. For example, medical discourse is made up of a set of anonymous rules that may involve power relations which permits a patient to express her medical concerns, and a medical practitioner to listen to them in ways appropriate to situation (Mischler, 1986). The statements within a discourse belong to a "discursive formation" just "as a sentence belongs to a text" (Foucault, 1972: 116). Whenever one can describe "thematic choices" between a number of statements, we have "discursive formation" which are dependent on "rules of formation" (Foucault, 1972: 38). "Discursive practice", the act of producing a discursive formation, can be defined as a "body of anonymous historical rules, always determined in time and space that have defined a given period for a given social, economic, geographical linguistic area, the conditions of the operative of the enunciative function" (116).[13] This implies that language is a historically and socially situated mode of action and that interpretations - indeed, the controversy spawned by *Primate Visions* - reflect differing discourses of scholarly communities. I expect that the disciplines into which the reviewers were socialized and within which their research interests are framed constitute discursive communities. I also expect that within disciplines, the adoption of a feminist perspective might lead to a distinctive discourse which influences the reception of Haraway's ideas in a positive direction.

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[13] Discourse is linked to discursive practice and discursive formation because discourse represents social practice and social practice represents discourse (see Theo van Leeuwen, 1993; Fairclough, 1993; van Dijk, 1993).

The general direction encouraged by Foucault and the specific expectations of the importance of scholarly discipline and feminist perspective has guided my management of the corpus of book reviews. I turn now to a discussion of the book reviews and the organization of the corpus by overall reception of *Primate Visions,* disciplinary affiliation and feminist orientation.

Overview of the Body of Book Reviews

There are at least 61 reviews of Donna Haraway's *Primate* Visions published between 1989 and 1994.[14] Fifty-six are examined in depth. One review written in Dutch by Marianne De Laet[15] was excluded from the analysis.[16] Three reviews published in "Biology Digest"[17], "Kirkus Review"[18], and "Times Lit Hits"[19] were written by anonymous authors, and were therefore excluded.[20] Finally, a short review written by Galen Strawson was excluded[21].

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[14] These reviews were found in the *Social Sciences Citation Index* and the *Book Review Digest*. No reviews were uncovered after 1994.

[15] De Laet, Marianne. 1991. De aap als spiegelbeeld: een verontrstend visioen. (The Ape as Mirror Image: An Alarming Visions). *Kennis en Methode* 1:142-147.

[16] This favourable review of *Primate Visions* was analyzed on its own terms, but was not used in the body of reviews from which comparisons were made because the nature of the discussion made direct translation from Dutch to English difficult.

[17] *Biology Digest*. 1989. October.

[18] *Kirkus Review*. 1989. July.

[19] *Voice Literary Supplement*. 1990. Lit Hits: Our Favorite Books of 1989. December, p.10.

[20] These highly favourable reviews of *Primate Visions* were excluded from my analysis because authors and disciplines could not easily be identified. I analyzed these favourable reviews separately and found that they did not affect my overall conclusions.

[21] Galen Strawson's (March 24, 1990. Monkey business on the planet of the apes. *The Independent on Sunday*, also reviews Dale Peterson's *The Deluge and the Ark: A Journey into Primate Worlds)* mixed review was excluded for two reasons. First, I was unable to identify him with a discipline. Second, his very short review did not seem to contradict my overall general conclusions.

The journals in which the reviews appear are diverse: journals specializing in gender and women's studies, a communication journal, sociology and anthropology journals, and a library science journal. Some of the more popular journals include *New York Review of Books*, *Newsday*, *Biology Digest*, *Times Higher Education Supplement*, *Times Literary Supplement*, *The Village Voice*, *London Review of Books*, *Kirkus Review*, *New York Review of Science Fiction*, *Z Magazine*, *Pittsburgh Press*, *The Semiotic Review of Books*, and the *Los Angeles Times Book Review*.

Three reviewers, Anne Fausto-Sterling, Sarah Franklin, and Lakshimi Banlamudi, each wrote two reviews in different journals. Two reviews are co-authored. The co-authored review by Michael Blitz and Louise Krasniewicz is treated as a single review. The review by Alison Jolly and Margarita Jolly is treated as two separate reviews because their review is presented as a dialogue with a clear delineation between the contributions of each author.

The reviews vary in length from one short paragraph to twenty two pages. The average review is between two and four pages.

First Sort

I grouped the reviews in three main ways. First, the reviews are grouped in three categories, according to their reaction to *Primate Visions*: 1) generally favorable, 2) generally unfavourable, and 3) mixed. This was done in order to preserve the controversy because as a body of work they represent diverse and controversial assessments of *Primate Visions* and defenses of what constitutes science.

Second, I grouped the reviews into broad disciplinary categories such as primatology and evolutionary biology, other science, social science, history of science, the humanities, and science fiction. Within some disciplines, such as the social sciences, I indicate subdisciplines. The reviewers represent varying backgrounds and disciplines such as primatology, physical anthropology, biology, sociology, psychology, social and cultural anthropology, archeology, history of science, English, film or communication studies, library science, and popular culture. I determined each reviewer's discipline by identifying the department of affiliation or the educational background of the reviewer. In many cases, this task was easily accomplished. That is, the department of affiliation was often supplied in the review or in another published article by the same author or in a faculty directory. In a few cases, I contacted reviewers personally.

Third, within disciplines, I identified reviewers by their orientation to feminist theory. Indeed, many of the reviewers in the above disciplinary groupings also consider themselves feminists; however, the term feminist needs some clarification. Feminism and feminist have been used in different ways. Furthermore, the meaning of feminist science and feminist epistemology has changed, since they have been the focus of discussion for over a decade now. While not diminishing the philosophical importance of these debates, for the purposes of this thesis, *feminist* will be used to specifically mean either that the book reviewer has openly identified her/himself as a feminist, or that through my exploration of past publications, the reviewer has *actively engaged* in research that specifically addresses a feminist/political agenda. That is, in the latter sense, a feminist will be actively engaged in changing the lives of women (and sometimes men) at a political level, or is particularly sensitive to gender inequality. In some cases, the information was vague or absent, so I contacted scholars personally. In these cases I would briefly explain my study and would ask for titles of recent publications, or ask outright if she/he would consider herself/himself a feminist. For example, the ornithologist Patricia Adair Gowaty calls herself a feminist in her book review of *Primate Visions*, so I labeled her as a feminist scientist. A second example, philosopher Sandra Harding, also categorized as feminist, has devoted much of her academic life to publications that deal with feminist/political issues of various sorts. Because a scholar is not identified as a feminist in this thesis, even though he or she may be doing research that ultimately involves gender issues, does not in any way imply that she or he is anti-feminist. This scholar may not make gender or feminist research an active part of their research program. Finally, it is possible, I believe, for a man who also is actively engaged in feminist research to be a feminist. In the present collection of book reviews, I do not categorize any men as feminists, even though they may ultimately agree with what Haraway has to say about feminist issues and may be sympathetic to feminist causes. For example, Larry Lohmann has said that he is pro-feminist (personal communication). One review was particularly problematic. Meredith Small's work is about gender, but it is not entirely clear whether she would accept or appreciate the label "feminist". Haraway herself considers Small's work to be bad feminism; however, because she has focused on gender issues in previous publications, I decided to categorize her "feminist", rather than overexaggerate the pattern, which shows that feminist scientists generally receive *Primate Visions* favourably.

A summary of the book reviews categorized by overall response (favourable, unfavourable, and mixed) by discipline and by feminist orientation (shown with an asterisk) is presented in Table 1. Duplication of names reflects authorship of two separate reviews.

Table 1 Book Reviews by Overall Response, by Disciplinary Affiliation, and by Feminist Orientation*

Discipline	Response		
	Favorable	Unfavourable	Mixed
Primatology or evolutionary biology	Judith Masters*	Robin Dunbar	Vernon Reynolds
	Patricia Adair Gowaty*	Alison Jolly	Anne Russon
		Susan Cachel	Craig Stanford
		Meredith Small*	Ron Dare
		Matt Cartmill	
		Peter Rodman	
		Laura Betzig	
		Misia Landau	
Other Science	Anne Fausto-Sterling* (1989)		
	Anne Fausto-Sterling* (1990)		
	Ruth Hubbard*		
Social Science	Susan Sperling* (anthro, cultural and physical)		
	Elvira Scheich* (political science and physics)		
	Hilary Callan* (anthro)		
	Sarah Franklin*(anthro/soc) (1990a)		
	Sarah Franklin*(anthro/soc) (1990b)		
	Deborah Heath* (anthro)		
	Marylyn Strathern*(anthro)		
	Louise Silverstein fem *(psych)		
	Joan Gero*(anthro/archeo)		
	Lakshmi Bandlamudi* (psych) (1990)		
	Lakshmi Bandlamudi* (psych (1991)		
	Caroline Humphrey*(anthro)		
	Melinda Kanner* (anthro)		
	James Tognoli (psych)	Clifford Geertz (anthro)	

Table I con't

Discipline	Response		
	Favorable	Unfavourable	Mixed
Social Science	George Marcus (anthro)		
	Micaela Di Leonardo*. (anthro)		
	Chris Nealon		
	Larry Lohmann		
	Caroline Ramazanoglu* (sociology)		
	Maureen McNeil (cultural studies)		
History of science			
	Dorinda Outram*		
	Margaret Rossiter*		
	Lynn Nyhart*		
	Joan Scott*		
	Greg Mitmann		
	Micheal Neve (history of medicine)		
Humanities	Gillian Beer* (English)		
	Sandra Harding* (Philosophy)		
	Christine Gudorf* (Philosophy and Religion)		
	Carol Anne Douglas*		
	Margaretta Jolly* (English, cultural studies)		
	James Beringer (communication studies)		
	Dana Polan (English and film)		
	Micheal Blitz and Louise Krasniewicz (popular culture)		
	Beth Clewis (Library Science)		
Science Fiction	Charles Elkins		
	Samuel Delany		
	Tom Madox		

A closer look at table 1 shows some interesting patterns. Identifying reviewers by broad disciplinary groupings enables one to see that there is a strong cluster of primatologists/biologists who wrote unfavourable reviews of Haraway's critique. Not all primatologists/scientists responded unfavourably, however. In the case of primatology, the only two favourable reviews are written by feminist scientists. Four of the fourteen primatologists wrote mixed reviews, the only mixed reviews in the corpus. These, however, do not appear to be influenced by a feminist orientation. Reviewers from all other disciplines, with the exception of Clifford Geertz, received *Primate Visions* favourably. With respect to all other disciplines, this favourable assessment does not appear to be influenced by adoption of a feminist orientation.

The pattern observed in Table 1 supports the claim that a controversy or clash of viewpoints exists but the presentation is too superficial to reveal much about the nature of the viewpoints. Because of the different responses amongst the primatologists/biologists, a specific discursive community cannot be identified by discipline alone. Therefore, a more in-depth analysis of the reviews is required. I turn now to a discussion of the textual analysis and the search for viewpoints, for the viewpoint represented in each review, and for shared viewpoints which I interpret as discourses.

Viewpoints and Discourses

After examining Table 1, the next step was to examine each review separately to answer these questions: What exactly does each reviewer like or dislike about the critique contained in Primate Visions? What is the reviewer's viewpoint on the meaning of science and the rules of scientific practice? I begin to answer these questions by preparing the texts. First, I numbered each sentence and paragraph of the text to facilitate comparison within and between reviews. When I quote from a book review, I will therefore indicate the source by paragraph number, and where applicable, by sentence number.

Some linguists have called a clause or string of clauses, usually contained in one sentence, which has a speech-act function such as complimenting or criticizing, a "discourse element" (Weiyen He 1993). After delineating the discourse elements, I then looked for features in the elements or sentences which said something about what she/he liked or disliked about *Primate Visions*, or what she/he revealed about her/his view on the meaning of science. Although I first examined each book review individually, I will draw on examples and excerpts from various reviews in order to illustrate the textual components I paid attention to. An examination of each review is not present in Chapter IV. This step serves merely as a stepping stone for an analysis of shared reactions and viewpoints in discursive communities, the interpretive analysis of which can be found in Chapter IV. The reader is referred to Appendix A for an illustration demonstrating how an individual book review was managed.

One very obvious way to assess a review with respect to the above questions was to examine the "mood" of the text. The mood can be found by looking at very positive or very negative sentences. A positive mood is created by historian Margaret Rossiter in the following sentence:

> *Primate Visions* is a stunning tour de force, and its impact will be felt in several fields for years to come (P5S5).

Sometimes a sentence or paragraph is simply descriptive as we see here in historian Greg Mitmann's review:

> In the African Hall of the American Museum of Natural History in New York City stands a large silverback gorilla surrounded by mountainous jungle, a volcano smoldering in the distance (P1S1).

Clearly, the opening sentence in Mitmann's review is merely descriptive; we do not know what he liked or disliked about *Primate Visions.* I marked the purely descriptive to ensure that nothing was overlooked. By doing so, I was able to see that depending on sentences that precede and follow, the apparent descriptive sentence may have an evaluative impact by its place in the string of sentences.

Another feature is markers of modality. Modality "indicates the speaker's judgment of the probabilities or obligations in what he or she says; it marks the speaker's stance" (Weiyun He 1993: 410), in other words it is the degree of affinity with a proposition (Kress and Hodge 1988 as cited in Fairclough 1992: 158). Modality can be relational, where the kind of relationship to an individual is considered, or expressive, where strong opinions of certain beliefs are articulated. Modality can also be objective or subjective (Fairclough 1993; Halliday 1985). This can be easily illustrated using the first sentence in primatologist Alison Jolly's book review:

> *Primate Visions* is ostensibly about women primatologists, but it takes a devious route (A. Jolly, P1S1).

This sentence could be categorized as an objective modality because it reflects traditional academic writing which usually avoids displaying any personal attachment to a statement (Fairclough 1992: 162). This does not mean, however, that Alison Jolly does not have a high degree of affinity to the proposition, for this sentence could be read as a positional comment on how Haraway's history deviates from some normative order.

Subjective modality is demonstrated in the first sentence of the review written by cultural studies theorist, Margaretta Jolly. She responds favourably to *Primate Visions*. In the dialogue with her mother Alison (who reacted unfavourably) she writes:

> I like your rhetoric of dangerous acrobatics and noble collective effort in the pursuit of truth (M. Jolly, P1S1).

Margaretta Jolly's affinity to the proposition is clear and is thus subjective modality; she likes Alison's rhetoric, which initially seems to be odd, since Alison unfavourably reviewed the critique in *Primate Visions*. However, one feature combines with others to reveal more about Margaretta's viewpoint.

This feature of a combination (prepositions, sentences, paragraphs or entire texts) is called a strategy of argumentation, it helps reveal what the reviewer liked or disliked about *Primate Visions*, or her/his view on the meaning of science. A strategy of argumentation can simply be defined as a claim and then a counterclaim. For example, Margaretta Jolly's second sentence reads:

> But it can only underlie Haraway's central point that science, like anything else, is embodied in narrative (M. Jolly, P1S2).

Margaretta Jolly begins the second sentence with "but", a key linguistic word in the *segment of argumentation* (Kopperschmidt 1985) and it becomes clear that the reason Margaretta likes Alison's rhetoric ("I like your rhetoric of dangerous acrobatics and noble collective effort in the pursuit of truth") is that it reinforces Margaretta's own agreement with Haraway's view on the meaning of science.

A second example comes from primatologist Alison Jolly:

> By the late 1980s, Haraway's primatologists study female primates as more fundamental to their troops' reproductive economy than the males. All this is true. But Haraway still gets us wrong.

Here we have a description of Haraway's work and a counterclaim introduced by the word "but".

Another way to reveal a reviewer's viewpoint is to look specifically for statements of criticism. Two kinds of criticism are evidential and conceptual. According to Longino (1990: 71-75), evidential criticism involves questioning the way hypotheses are supported by evidence, analysis, and reporting. Conceptual criticism involves the metaphysical and can be categorized in three ways: 1) soundness of the argument, 2) agreement of a hypothesis with accepted theory, and 3) the relevance of evidence. The first and second do not critique the data per se, or how accurately it has been measured or reported, but rather the assumptions which color the interpretation. The third "amounts to questioning the background beliefs or assumptions" and what becomes evidence, and is "crucial for the problem of objectivity."(1990:73). An obvious example of evidential criticism comes from Susan Cachel and from Meredith

Small:

> This is not an objective account of the history of modern primatology, and the special biases are not subtle (Cachel, P1S6).

> More disturbing is Haraway's inconsistent support for her particular path of deconstruction (Small, P5S1).

Sometimes the clear content of a statement reveals a specific point of contention with Haraway's position. For example, one reason that Matt Cartmill disliked Haraway's book was because he considered it to be antiscientific:

> Despite Haraway's protestations to the contrary, *Primate Visions* strikes me as an expression of hostility and contempt, of the scientific enterprise in general and to primatologists in particular (P16S1).

Similarly, beliefs about knowledge, and views on the meaning of science can be expressed in a statement or series of statements:

> Science is grounded in the belief that there is a real world and that by studying it and experimenting with it, we can understand, predict, and control its phenomena. To dismiss this belief as "the aesthetic of realism," a literary convention adopted for political ends, amounts to saying that scientists do not really understand what they are doing, and if they did, they would stop doing science and start doing the sort of thing that Haraway demands of Goodall (P16S2-3).

This example permits me to emphasize the point that a "hermeneutic" or interpretive analysis involves looking at the part in relation to the whole. By examining the parts in relation to the whole texts, the viewpoint of the reviewer can be discerned.

Having sketched the viewpoints and reactions contained in each review by looking at specific statements, mood, etc., I then searched for shared points of view, or discursive communities. This interpretive analysis is present in Chapter IV. In making these comparisons I followed the logic of the first sort by comparing points of view to overall response, disciplinary affiliation, and feminist orientation. This step was again interpretive, or hermeneutic and is inspired by the academic tradition which focuses on textual and rhetorical analysis (see Simon 1989; Turner 1992; see also Polkinghorn 1988; Thompson 1990). That is, in order to understand the book review as a text and as a representation of a view of science, I had to investigate the discursive practices at the level of the sentence and paragraph, but to understand this I had to understand the representations of science as a whole. I wanted to assess whether there were common reactions and shared points of view of science. My search was guided by the following questions:

- What is the meaning of *Primate Visions* within different disciplines, and how is that meaning created through language use and rhetoric?
- Are there any patterns between disciplines? Within disciplines? What common assumptions can be found in the different communities? Can the common assumptions constitute different discourses on science?

Having examined shared points of view and common underlying assumptions or discursive communities, I was in a position to characterize the debate of the discourses of science. Neilsen has characterized a traditional view of science (discussed in Chapter 1) as a view where the real world is comprehensible, the subjective knower and the objective world are separate, validation can provide accurate information about the world, the social world is ordered, and where there is a "unity of the sciences" (Neilsen, 1990: 4-5). It could also be said that a traditional, positivist, or conventional view of science is characterized by lack of full reflexivity.

That is, the roles of social and cultural influences on scientific practices are not fully considered. Furthermore, a scholar who represents this view of science constructs debates in extremes; you are either objective or relative. A scholar with this view believes in boundaries of knowledge; that scientific knowledge is much different than other forms of knowledge, and that the scientific method is the preferred method of inquiry. Reviewers with this view on science rely on evidential criticism, and they criticize language that is not common or standardized. Most of the scholars who wrote unfavourable reviews (except for Clifford Geertz), that is eight of the primatologists/biologists represent the conventional view on science. (See Appendix B for an illustration of shared and common reactions to *Primate Visions* in one discursive community. These shared reactions are consistent with the conventional view of science.)

I have called a view that opposes the predominant, conventional view of science, an alternative view of science. Several characteristics define the alternative view of science which are different than those of the conventional view of science: a presence of reflexivity, a rejection of the objective/subjective, relativism/objectivism polarization, a reconceptualization of nature and science (Fedigan, 1995), a focus on the interpretive tradition (Neilsen, 1990), a tendency to borrow ideas from other disciplines (or permeation of knowledge), and a goal to negotiate the meaning of science. For the most part, the reviewers who wrote favourable reviews represented alternative views of science.

A mixture of both alternative views and conventional views is a mixed view on the meaning of science (see Appendix C), represented by those primatologists who gave mixed reviews of *Primate Visions*.

In Chapter IV, I will examine the different discursive communities which are characterized by their view of science: Primatologists/biologists who express conventional views of science; social scientists, historians, and scholars in the humanities who express alternative views of science; two primatologists/biologists and two "other" scientists who express alternative views of science; and finally primatologists who wrote mixed reviews expressing mixed views of science.

CHAPTER IV

INTERPRETIVE ANALYSIS

Introduction

I will begin this chapter by first exploring the conventional view of science as reflected in the eight primatologists/biologists' negative reactions to *Primate Visions*. I will then examine the alternative view of science as represented in the reviews written by social scientists, historians of science, and scholars in the humanities who responded favourably. The remainder of the chapter turns to alternative views as represented in favourable reviews written by primatologists and other scientists, where the role of feminism within a discipline is highly influential, and to mixed views.

Primatologists and the Conventional Meaning of Science

Eight primatologists/biologists responded unfavourably to Haraway's *Primate Visions*. The scientists and the journals in which they wrote their reviews are: Susan Cachel in *American Journal of Primatology*; Matt Cartmill in *International Journal of Primatology*; Robin Dunbar in *New York Review of Books;* Alison Jolly in *New Scientists*; Misia Landau in *Journal of Human Evolution*; Peter Rodman in *Current Anthropologist*; Meredith Small in *American Journal of Physical Anthropology*; and Laura Betzig in *Contemporary Sociology*. All of these scientists have strong biology backgrounds.[22] Four are also interested in the social aspects of science.[23]

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[22] Robin Dunbar, for instance, wrote *Primate Social Systems* (1988), published by Cornell University Press. His interests include reproductive decisions in humans and non-human primates and economic analyses of gelada baboon social strategies. One of Dunbar's papers appears in *Human Reproductive Behavior: A Darwinian Perspective* (1988) edited by Laura Betzig (a fellow reviewer), Monique Borgerhoff Mulder, and Paul Turke (published by Cambridge University Press).

The unfavourable reactions were rife with negative words, obvious examples of disagreements with both the content of Haraway's text, and her beliefs about knowledge. Negative words below such as "wrong", "unfriendly" and "silly analogies", are conscious oppositions to Haraway's characterization of primatology. Alison Jolly (1990), the veteran primatologist, states that Haraway takes a "devious route", and that she gets primatologists "wrong" (1990:5 8). Matt Cartmill (1991: 67) and Susan Cachel (1990: 139, P1S5) found the book "infuriating". Primate Visions is "unfriendly" in Cartmill's eyes and he believes that the book "is supposed to infuriate people like me, and [Haraway] would have been happier still if I had blown an artery" (1990: 67). Meredith Small could not take *Primate Visions* seriously because it was "couched" in "silly analogies" (1990: 528). Rodman, too, advises that "scholars cannot take this biased story seriously" (1990: 486). These are not light criticisms of *Primate Visions*, but rather passionate concerns about Haraway's portrayal of primatology. Detailed analyses of these reviews reveal that these scientists are responding passionately and negatively to the same themes.

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[23] Four scientists have backgrounds and interests in addition to biology. Alison Jolly who majored in French and zoology in her undergraduate years, studies lemurs in Madagascar and is considered by Haraway to be a scholar who is cognizant of how external factors influence her research, yet she gave *Primate Visions* an unfavourable review. Misia Landau wrote her Ph.D dissertation under the direction of the well known paleoanthropologist David Pilbeam at Yale University. She completed her Masters degree at Oxford University in human-biology and spent most of her time in a neurology laboratory as "a conventional white coat scientist" (Lewin 1987: 30). She changed intellectual direction and decided to take on something more theoretical by combining literature with science, studying early paleoanthropological ideas (Lewin 1987). While Landau on the surface might appear to be engaging in work similar to Haraway's, Landau firmly believes in the transcendental nature of science and that exploring flaws (hero-like narrative structures) in early paleoanthropological stories can help scientists become more empirical. Meredith Small is a primatologist at Cornell University. She was the editor of *Female Primates* (1984, New York: A.R. Liss) and has written other books where gender is concerned. Despite the seemingly feminist title of the book, Small was not treated favourably by Haraway in *Primate Visions*. Haraway found that this book foregrounded female primates and their activities at the expense of male primates; female bias simply replaced male bias, so Haraway did not consider her book exemplary feminist scholarship. Matt Cartmill, a professor in the Department of Anatomy and Anthropology, is interested in the philosophy and history of science, as well as biological aspects of primate life. Nevertheless, these scholars seem to favour the rhetoric of science.

Their underlying assumptions represent a conventional view of science: for example, they believe Haraway is a relativist; she is antiscientific; she is not objective; she does not say anything about the real world; her language is obtuse. These criticisms are common to many of the primatologists who responded unfavourably. By looking at their reactions to *Primate Visions*, it is possible to understand their view of the meaning of science. Although there are exceptions, generally speaking they believe in Neilsen's definition of the traditional view of science discussed in Chapter 1: the world is comprehensible, the subjective knower and the objective world are separate, validation can provide accurate information about the world, the social world is ordered, and there is a "unity of the science" (Neilsen 1990: 4-5).[24] In other words, values can be separated from facts; reality is the basis for whether a claim is true or false; truth is universal; and one can have access to the truth, and there is a correspondence between a knowledge claim and reality (Alcoff 1987). These primatologists seem to believe that, with the proper methods, values can be separated from facts and a scientist can comprehend the world. Because the primatologists here are well entrenched in their view on science and wish to control the meaning of science, it is difficult for them to fully engage in a debate over the meaning of science. For reasons outlined below they dismiss and outright reject Haraway's work. In contrast, it will be shown that those who have the alternative view on science wish to dismantle the traditional view of science that Neilsen speaks of.

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[24] I am not implying here that primatology is a monolithic field, absent of varying viewpoints on specific scientific problems. I am instead trying to pinpoint underlying assumptions common to the *reactions* to Haraway's alternative view of science.

Minimal Reflexivity

An important feature of the book reviews written by the primatologists who responded unfavourably was that they expressed "minimal reflexivity" (Giddens 1985). In chapter 1, I defined reflexivity which refers to an acknowledgment of social and cultural influences that shape perceptions of the world. Minimal reflexivity means that a person or a group of people who have a dominant viewpoint will at a minimal level attempt to understand the viewpoint of the person or group of people who have an alternative viewpoint. Giddens (1981; 1985 in Waters 1995) argues that when the fundamental assumptions of the predominant view are called into question, the predominant view adopts a stance of minimal reflexivity. If it did not adopt this stance, then it would fail to understand or to recognize heresy or counter hegemony when a group expressing an alternative viewpoint opposes the predominant viewpoint.[25]

For example, primatologists who show that they understand Haraway's claim that science is not immune to personal and social biases are showing reflexivity. What I have interpreted as occurring in this group of reviews is that the primatologists are aware of Haraway's viewpoint, but ultimately undermine that claim by pointing out *Primate Visions'* weaknesses, in the form of evidential and conceptual criticisms.

That is they acknowledge biases in science, but feel they should go on doing business as usual. Subsequently, the primatologists read Haraway's claim that bias affects science as a threat to scientific authority, whereas Haraway has also been read

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[25] In Antonio Gramscian terms this is the idea that a subordinate or marginal group resists the dominant view of the time.

(by feminists) as someone who shows how some biases work with rather than against science, and that by acknowledging these biases better science can be conducted.

A few examples will illustrate that there is remarkable continuity, in terms of minimal reflexivity, among the primatologists/biologists, with several of them expressing almost identical sentiments. They express a degree of respect and affinity for Haraway that implies openness and self criticism, but they stop short of threatening the final authority of conventional science.[26] Minimal reflexivity can be observed when a primatologist makes a claim (to show awareness of contextual values) and then a counterclaim (to undermine Haraway and the claim that contextual values *really do* play a role in the way one sees the world). Meredith Small's review (1990) illustrates this point.

> Primatology, as a science, and intellectual pursuit, and a way of life, is ripe for critical analysis. Under the guise of empiricism, primate behaviorists spend long hours in the hot sun (or in the tropical rain as the case may be) recording the minute actions of our non-human primate relatives. Consciously or unconsciously, primatologists become absorbed by the social drama that unfolds before them. Because of the empathetic nature of watching monkeys and apes, it comes as no surprise that interest in a particular subject or interpretation of data has been guided by one's own psychology, race, gender, and social milieu. At the same time, no primatologist worth his or her salt is particularly worried about this interaction; it comes with the territory (Small, 1990:527 P1). (and see also P2)

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[26] For example, Jolly writes, "All this is true. But Haraway still gets us primatologists wrong" (Jolly P1; P2; P3; P4S1-3). Dunbar suggests, "Ms Haraway offers us valuable insights into how individual's personal interests can influence their science and into the role of networks of colleagues play in the formulation and execution of scientific programs. Unfortunately, many of the arguments she deploys are seriously flawed" (Dunbar, P4). Similarly Cartmill comments, "There are real insights and intermittent flashes of brilliance scattered throughout the book . . . . All primatologists will benefit from reading from it and getting their preconceptions shaken up" (Cartmill, P12S1). But then writes that the good things are outweighed by the biases and her postmodern epistemology(S2-3). Finally, Peter Rodman agrees with some of Haraway's observations, but in believing that facts are facts and values are values, he considers Haraway's book to be biased and should not to be taken "seriously". Susan Cachel, for instance, likes the section on Japanese primatology in Haraway's book, which draws on ideas borrowed from Pam Asquith's work, perhaps because it does not jeopardize the integrity of Western primatology. The sympathetic method (*kyokon*) is employed by the Japanese to understand non-human primate societies and is distinct to Japanese primatology (see Cachel P9).

However, a series of criticisms that follow this paragraph show that after agreeing with Haraway about the influence of external factors on science (above), Small (1990) contends that Haraway's claim that science is influenced by race and gender is not supported by her analysis (evidential criticism). Haraway must be incorrect and therefore, social and cultural influences do not really influence the way a scientist practices science. That is, she denounces Haraway's analysis, and tries to criticize Haraway's viewpoint on knowledge (conceptual criticism), so that she can conclude by saying that external influences do not always color one's work, "Dominance and aggression are not figments of the male-centered primatologist's imagination" (P5S7).

Like most of the primatologists who responded unfavourably, Betzig is self reflexive when she says that it is obvious that biases affect everything that humans do, including science (P2S1). She reiterates this and uses the American Museum of Natural History and Yerkes as examples (P3S1) as I discussed in Chapter 2 (page 29 of this thesis). Yet, she says that the "biases are lessening", which suggests that as scientific standards improve (this could be read to mean that as objectivity improves), biases can be eliminated (P3S6-7), thus reaffirming the final authority of science. Betzig draws on the example of Jane Goodall's work in Gombe, Africa as described in *Primate Visions* to show that biases affect the questions scientists ask (P4S1), but they do not affect the answers they get (P4S1; P4S3).

It should not be completely surprising that many of the primatologists reacted unfavourably because they are part of the group of practitioners which Haraway critically investigates. Perhaps Landau is quite legitimate in pointing out that

Haraway's treatment of some primatologists is "heavy-handed" and this may be part of the reason that they reacted so negatively and that they defended science. Furthermore, it is possible that Haraway's text could have been read in many different ways, both unfavourably and favourably, because it is often times ambiguous. Yet it is less the eight primatologists/biologists' overall negative reaction and more the *ways* they reacted that characterize the feature of minimal reflexivity.

Understanding Minimal Reflexivity

Reflexivity, the ability to reflect upon one self, to redefine a particular set of social relations, and to open yourself up to the possibility of change, can become institutionalized (Ray Morrow, personal communication). The primatologists/biologists who responded unfavourably do not open themselves up to the possibility of change. The primatologists' reviews express some minimal reflexivity, an example of how this discursive practice influences the discourse of primatology. Primatologists' response to Haraway as a feminist critic of their science is an example of a new discursive practice of having to defend themselves and their position as the predominant view of science.

We saw only a minimal amount of reflexivity in the primatologists' reviews because full reflexivity exposes the limitations of science, thus limiting its authority. This minimization of reflexivity is related to maintaining authority of a specialization (Fuller 1993). Therefore, Haraway's history of primatology is perceived by the primatologists/scientists who responded unfavourably as undercutting their scientific authority. It has been suggested that science has achieved its power by "rhetorically" emphasizing that science "represents the world" and de-emphasizing that it also represents an interference in the world (Fuller 1993: 126). For Fuller, the sciences illustrate "Baconian virtues"; they produce knowledge that sustains social order (as Donna Haraway argues, this *order* may come in many forms, such as male domination in the sciences, and control over subjects - Haraway's description of Harry Harlow and his rhesus monkey deprivation experiments are the perfect examples), but they attempt to appear autonomous from that production (see Messer-Davidow, Shumway, and Sylvan 1993). Understanding the rhetorical purpose of minimal reflexivity, we are now able to examine the thematics found in the book reviews, some of which are (mis)interpretations of Haraway's work.

Haraway is Perceived as a Relativist or Reductionist

A second underlying assumption common to most of the primatologists/biologists who responded unfavourably is that they believe Haraway advocates that scientific knowledge can only be created and not discovered (e.g., Jolly). That is, they believe that, for the most part, Haraway is a radical relativist (e.g., Cachel), a scholar who denies positivism because truth is relative and denies objectivism, which is determined by rationality, knowledge, truth, and reality (Berstein 1983). If she is not labeled as a relativist, she is portrayed as someone who reduces all events to the social realm and is by inference a reductionist (e.g., Small P4S1-2; Landau; Cachel, P6S2; Dunbar, P10). This is exemplified in some scientists' explicit objection to what they perceive to be a blurring of science fiction and science (Jolly, P4S4-8; Dunbar, P9S1, P9S4, P10, P11S1); Cartmill, P5S2-7; Rodman, 1990), or of science and politics, or simply social construction (Cartmill, P2S5-7, P3S13, P4S3-4; P4S6; P7: Betzig, P7S1, P8S9; Landau, P6S2, P11S1-2).

Primatologist Susan Cachel reiterates the theme that Haraway is a relativist a number of times in her review (P2S2-S8; P2S11; P3S2-3; P3S6; P4S1). As a stratagem to show that Haraway is indeed a relativist, she sometimes links her perception of Haraway as a relativist to Haraway's use of words like "storytelling" and "narratives". Accordingly, she represents Haraway as having said:

> There is no objective reality against which to gauge scientific ideas. All science is relative, and primatology is a discourse or text subject to local interpretation. " Evidence is always a question of interpretation; theories are accounts of and for specific kinds of lives . . . . Primatology seems to be a science composed of stories, and the purpose of the this book is to enter into contestations for their construction" [p. 8]. The author clearly believes in Kuhnian paradigms in their most extreme presentation. The social milieu, not the accumulation of disrupting facts, offers reasons for accepting one paradigm over the another. Primatology is not science but narrative or story telling (Cachel P2S2-8).

Meredith Small (P4S1-2) assumes that Haraway "always" believes that politics play a role in scientific inquiry. Another strategy used to label Haraway a relativist, and thus to undermine her work, is to associate relativism with postmodernism:

> Much of cultural anthropology has succumbed to interpretive/symbolic stances of this sort, and post-processualist archeology has also fallen prey to fashionable post-modernist relativism. Cultural relativism, an idee fixe, and a lack of interest in material culture may be responsible for the orientation of much present-day cultural anthropology (Cachel P3S2-3).

Cartmill acknowledges that Haraway does not want to reduce science to a cynical relativism; however, Cartmill extends his strategy of argumentation to include his belief that Haraway lacks criteria for distinguishing between poor and good science because she believes there are no such things as facts (P4S3-4). He supports this claim by pulling out quotes from Haraway (p. 309 - can science be postmodern?); according to Cartmill, she is a relativist because she associates herself with a research program that espouses relativism! Here, as in Cachel's review, postmodernism is synonymous with relativism; Cartmill finds, as described in several paragraphs (e.g., P12, P18),that her postmodern epistemology is the major problem with her analysis. As we saw in Chapter 2, Haraway makes several efforts to show that she is not a relativist.

The standardization of language, for instance the words "infuriating" or "disturbing" or "antiscientific", could be considered another form of authority behind the discourse. For example, it has been suggested that standardization was important in the formation of "nationhood". More specifically, the standardization of the English language is really a "class dialect", even though it can be used by all classes, because it has been used as an advantage for important job positions of power. (Fairclough 1989: 56-58). However, the same could be said for Haraway's work. Some primatologists made this kind of criticism about Haraway's language. Landau, for example, wondered how oppressed people could benefit from Haraway's use of elitist language and meaning (P11). In this sense, Haraway could also be said to have a "class dialect". A common criticism of critical theory or poststucturalist perspectives (which Haraway makes use of), is that it is elitist (Morrow 1994).

Haraway as Antiscientific, as Debunking Science, or as a scholar not writing for scientists but for deconstructionists

A related third point of contention is the idea that Haraway is actually trying to debunk science, she attacks it[27] (e.g., Cartmill P8S2; Cachel, P5S4; Dunbar, P11S5; Rodman, P3S3), condemns it (e.g., Rodman P8S1), or is simply antiscientific (e.g., Cachel, P2S1, P6S3). Fear and resentment are provided as motives for debunking science (Cartmill, P2S3). There are examples of both relational modality, where Haraway is the target of criticism, and expressive modality, where strong opinions of certain beliefs are articulated. According to Cartmill, Haraway does not believe that science directly corresponds to reality, and for this reason, she is considered hostile, contemptuous, and unfriendly:

> Deconstruction is not a friendly act, and Haraway's approach to science in general and to primatology in particular is an unfriendly one, which makes no effort to understand or sympathize with the intentions of scientists (Cartmill P4S3). . . . Despite Haraway's protestations to the contrary, *Primate Visions* strikes me as an expression of hostility and contempt, to the scientific enterprise in general and to primatologists in particular. Science is grounded in the belief that there is a real world and that by studying and experimenting with it, we can understand, predict, and control its phenomena. To dismiss this belief as "the aesthetic of realism," a literary convention adopted for political ends, amounts to saying that scientists do not really understand what they are doing, and if they did, they would stop doing science and start doing the sort of thing Haraway demands of Goodall. I think it is fair to describe this contention as hostile and contemptuous (Cartmill P16).

Two primatologists write about how Haraway's perspective is targeted only for deconstructionists (Small, P6S2; Jolly, P7S6). This strategy marks Haraway as an outsider. The primatologists and/or evolutionary biologists sometimes use the pronoun we to include other primatologists, but to exclude critics like Haraway. If the pronoun is not specifically used, then a remark might be made to include or exclude, such as the one made by Landau who wonders if Haraway has ever touched a monkey. The use of the pronoun we (e.g. Jolly) or the use of the word postmodernists (Cachel, Cartmill) or the more general intellectual pursuit identified as postmodern epistemology (Cartmill) serves to exhibit a union of scientists and synthesis of ideas in favour of conventional perspectives on science. As we saw in chapter two, Haraway states several times that she wants to improve the way science is practiced. Clearly, the primatologists do not think so.

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[27] For example, throughout her review, Landau remarks how Haraway's treatment of primatology and certain primatologists, such as Ackley for example, is mean spirited. For Landau, Haraway has no "affinity" for her subject (P1S3); her treatment of Ackley is "self-defeating" (P6S1); her treatment is also "heavy-handed" (P6S3); the way in which she discusses Yerkes is "condescending" (P7S1); and her treatment of Goodall is "hyperbolic" (P8).

Against the Permeation of Boundaries

A fourth underlying assumption is that most primatologists are against the permeation of boundaries. In most cases they are against blurring the boundary between nature and culture, and between reality and myth (e.g., Cachel P3S6, Cartmill, P5S2; Dunbar, P5S1-2). In other cases, they are against the use of disciplinary tools such as those of literary criticism for use *in* the sciences, or the use of literary criticism for the study *of* science (e.g., Cachel, P2S9, P3; Dunbar, P12S1-2; Cartmill, P3S1-3). Matt Cartmill's review provides an illustration of this point. When read in context, Cartmill does not agree with Haraway's description of science:

> Since facts and data are constructs, Haraway regards primatology and other sciences as literary forms. She acknowledges no epistemological difference between science and science fiction, between *Molecular of the Gene* and *ET*.: both are stories, differing only in features of narrative style. "Scientific practice may be considered a form of storytelling practice," Haraway writes. The facts themselves are types of stories" (pp. 3-4). All those old positivist representations of science as cumulative knowledge grounded in observation are stories of another sort - "stories with a particular aesthetic, realism, and particular politics, commitment to progress" (p.4). All statements about organisms necessarily take the form of stories . . .(Cartmill. P5S2-7).

It is also clear that Cachel, Jolly, Dunbar, Cartmill, and more implicitly Small (P3) do not want the spread of social science's most recent trend in questioning positivism (and social science's methods, such as deconstructionism and its theoretical counterpart postmodernism) to spill over into the natural sciences. For these primatologists, the idea of permeation from the social sciences to the natural sciences threatens the authority of science and further weakens the demarcation between scientific knowledge and other forms of knowledge, such as science fiction (e.g., Cartmill, P5S2-7, P5S8-10; Dunbar, P6S2-4; Jolly, P4S6), a theme related to the idea that Haraway is considered a relativist .

Haraway is not Objective / Her Analysis is Flawed

All the conventional primatologists believe that Haraway is not objective, and her evidence or lack thereof is criticized. Again, as with the other themes the recurrence of this theme in each review is noteworthy. Haraway is biased (Rodman P13); she misses the point (Rodman P5, Cachel P10); her analysis is not a real history of primatology (Cartmill); she "distorts evidence" (Cartmill P1S2); she makes connections where there are none (Cartmill P13S4; P14; P15); she does not test her perceptions, and deconstruction is not "suited to affirmation" (Cartmill P8S5).

Cartmill's review, in particular, is replete with statements that allude to some aspect of Haraway's analysis that is not objective. Her deconstructive method allows her to see only that which is in her political agenda (Cartmill P10). According to Cartmill, Haraway "distorts and selects historical evidence"[28]

The contention that Haraway is not objective is related to the idea that she does not provide *empirical evidence* to back up her claims, and again this is used to show that she believes that all science is socially constructed. For example, Small says that she provides no evidence to explain why she sees something from one perspective and not the other (Small P5S1-9). Cachel, in particular, wants Haraway to be objective and provide evidence for her claims according to the rules of the scientific method (Cachel, 1990:139, P1S6, P2S2 and see also P6, P7, P10).[29]

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[28] Rodman, too, writes about Haraway's highly "personalized fabrication" (P5S2) and "again there is a slant" (P3S2), and "she misses or ignores" certain things (P6S4). For example, Haraway describes "Social Relationships and Social Cognition in Non-Human Primates" written by Cheney, Seyfarth, and Smuts (1986) as a "disturbing historical document without any explanation of what is precisely disturbing about it " (Rodman, P10S7-8). In his conclusion, he urges scholars not to take "this biased story of primatology seriously" (P13S2).

[29] Similarly, Dunbar says that Haraway includes a "great deal that is irrelevant", and is "so preoccupied" with American primatology that it "border[s] on the narcissistic" (P7S3). He goes on to write that a focus on the European primatologists who treat primates as animals rather than as almost human would undermine Haraway's agenda (P7S4-5). Dunbar seems to be suggesting that if we treat primates as animals rather than as humans, then there is less chance of politics and anthropomorphism intervening in the study of them. The other problem for Dunbar is that Haraway treats primatology as if it were a unified discipline and "in fact the strands she chooses to highlight have about as much in common as Rembrandt, Salvador, Dali and whoever paints camouflage on military vehicles" (P7S7) and it is "curiously lopsided" (P7S2). Dunbar (1990) concludes that Haraway does not use reason in her analysis: "Criticism, as Mao Zedong once remarked, 'should be fully reasoned and convincing, and not rough, bureaucratic, metaphysical and dogmatic'. *Primate Visions* comes unusually close to failing on most of these counts" (Dunbar, P14S5, see also P9S4 "strained interpretations" and P4S2). Betzig and Landau also criticize Haraway for her lack of objectivity, providing an illustration of the consistency of thematic choices in these primatologists reviews. Like the primatologists, Betzig believes that Haraway's analysis was selective in inclusion of evidence, "if not distortion" (P5S2) of the evidence she uses to strengthen her own biases: there was male bias in primatology that can be traced to patriarchy and capitalism. Betzig declares that Haraway ignores much evidence where there is no male bias, and where male ecologists develop theories about both males and females (P4S4):

> Similarly, Haraway stresses that Richard Wrangham's female-centered version of primate societies owed much to Barabara Smuts and other women, as he acknowledges himself: but she makes much less of the fact the 'the functional explanation that females are distributed by food and males by females was in the bird literature that [Robert] Hinde urged Wrangham to use" (p. 178) - literature developed by mainly male ecologists working with theories developed by mainly male biologists (Betzig, P4S5).

Haraway's "thesis" in the end is "convincing" for Betzig, but Haraway's "case" is not (P2S4). Betzig implies that Haraway has not provided a reliable representation of science, for she has given us a history of science, rather than a science of science (P5S3-4).

Landau finds Haraway's terms, such as storytelling and simian orientalism, "vague" (P4S1). As someone who has written about storytelling practice in paleoanthropology, Landau says she is confused about a

The unity of this theme in all of the conventional reviews is striking. While each primatologist might emphasize different aspects of Haraway's analysis to show that she is not objective or that her analysis is flawed, they all share the same underlying assumption that science is different from non-science and that there are certain criteria, according to the scientific method, such as the construction of meaning through binary opposition, that define objectivity. For them, Haraway breaks this rule. The primatologists rely on evidential criticism (Longino 1990) to build their case. Haraway, having written more a reflexive paper than an empirical one, is not able to please primatologists/evolutionary biologists whose underlying assumptions are of a conventional view of science.

Haraway Does Not Say Anything About the Real World

There is yet a sixth theme in the reviews written by primatologists and biologists who responded unfavourably, and this theme combines all of the above points of contention. That is, that a history of primatology should be about how science works internally, the practice of science, or the context of discovery, and should not be about historical circumstance or the discovery of justification. Small, Jolly, and Cartmill all agree that Haraway "still gets us primatologists wrong" (Jolly P4S2). Most of the

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notion: If Haraway attempts to overturn the view of science that advances from dark to light, why does *Primate* Visions read like a "hero tale, in which the ideological blindness of men like Ackley, Yerkes, Carpenter, Washburn, and Harlow - and even the young Goodall - are overcome by 'feminist' primatologists like Jeanne Altmann, Linda Marie Fedigan, Adrienne Zihlman and (more ambiguously heroic) Sarah Hrdy" (P10S2). Landau herself has written about the storytelling practices of scientific descriptions of evolution, but still believes in the traditional notions about scientific inquiry. In her storytelling practices, notions of objectivity are never directly questioned, and she certainly believes, as evident in her conclusion of her articles, (1984) in the advancement of science. For Landau, uncovering the storytelling practices of evolution stories can help paleoanthropolgists practice better science. Haraway, of course, does attempt to overturn the notion of progress from bad to good, dark to light, and she has repeatedly declared that her endeavor, like Landau's, is meant to be productive. But, in a different way, because it is meant to be productive not only to those empirically minded scientists, but to feminists who want social action. But Landau's point serves to reify scientists' confusion over Haraway's implementation of postmodernism.

primatologists declare that because Haraway is biased, she cannot say anything about what is "real", and therefore, we should dismiss what she is saying. For example, Small is frustrated because as a deconstructionist, Haraway is supposed to find the *true meaning* (see P3S1) but in Small's view, Haraway fails to find the true meaning or to "shed any light on primatology or primatologists" (P2S6):

> The aim of a deconstructionist is to discover the true meaning, and perhaps the motivation, behind an issue and the participants who mediate the discourse. This is an interesting and noble pursuit, but it cannot substitute for plain old scholarship; in fact such an analysis necessitates a thorough grip of all sides of the issues and the historical development of that controversy . . . unfortunately she stops short of thoroughness . . . . More disturbing is her particular path of deconstruction. This is not an objection to personal opinion, only personal opinion disguised as fact (Small, P3).[30]

Furthermore, Small believes that Haraway's book is meant for other deconstructionists and nor for primatologists (P6S2). Small says she is still "waiting for a critical analysis" of primatology because "none of the interesting questions are answered" (P6S9-10).

The most telling statement comes from Dunbar who writes: "We learn only about the inventiveness of the mind, and little or nothing about the real world. This is to be regretted, for valid criticism risks being written off as yet another form of 20thcentury capitalism" (P13 S3-4). The idea that her book does not tell us anything about the real world is related to the idea that her argument has many serious flaws (e.g., Dunbar P4S2) and is selective (e.g., Cartmill, Small), and that she reduces everything physical to the social realm.

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[30] Personal opinion and fact are seen as two distinct entities. Their meaning is constructed through binary opposition:

> More disturbing is Haraway's inconsistent support for her particular path of deconstruction. This is not an objection to personal opinion, only personal opinion disguised as fact. There are few references to explain why she views a scenario in one way and not the another. She often writes for paragraphs about social milieu (see, for example, in Chapter 15 the discussion of sexual politics in the 1970 and the 1980s) without any reference to historical fact. This is also apparent in her evaluations of individual primatologists. Is it necessary to read the motivations behind the careers of living scientists? Why not just ask them? Throughout the book Haraway often searches for hidden motivation, often past the point of absurdity. This insistence for the extreme undermines her credibility (Small, P5S1-9).

Small's reiterates her dislike of Haraway's bias in paragraph four (S5-7) and, like Cartmill, goes on in Paragraph seven to discuss how Haraway is selective in the material she chooses to highlight in order to emphasize her own agenda.

Cachel too seems surprised that Haraway "treats" facts instead of using them (P2S10). Cartmill also acknowledges that Haraway has no interest "in the 'objective' facts about primates themselves" (see P4S4-6). Cachel wonders why more attention is not devoted to Sherwood Washburn, especially when the book is supposed to be a history of primatology (P6S2, P8). In her eyes, it is not a real history of primatology. Jolly believes that the book is mainly about women primatologists (P1S1) and thinks like Small, that it is meant only for deconstructionists (P7S6). Primatologists evidently expect a history of primatology to document advances in the understanding of animal behavior, rather than the cultural context of the study of animal behavior. This has led to comments that her book will not "inspire" or "touch primatologists deeply" (Landau, P12S4-7, 11 and see also P2S3).[31]

Haraway's Language and Style of writing are Considered Obscure

In a seventh theme, eight primatologists disliked Haraway's language and jargon. Some characterized it as a postmodernist, deconstructionist style of writing (e.g.,

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[31] Haraway's attention to external factors in primatology does not surprise Landau because "the focus [of Haraway's analysis is] the 'mediation,' negotiation' and 'appropriation' of nature and culture rather than the social interactions of apes and monkeys" (P2S3). Because Haraway's interests and feelings are not the same as those of primatologists, Landau feels that *Primate Visions* will not touch primatologists deeply and they will not be inspired by it even though other intellectuals may "heed Haraway's call" (P12S4-7, 11). Interestingly, Landau, as biologist and narrative theorist, sees Haraway's use of science fiction as a trope.

Small, P2S7, P6S1, P6S4-5, P6S7; Cachel, P10S5-6, P10S8; Dunbar, P5S3, P12S3-4; Cartmill, P3S5-6; Rodman, P10S1).[32] Jolly, for instance, says:

> Primate Visions is written in armor-plated post-modern feminist jargon. I can see no intellectual excuse for this, but I can see a social reason, if post-modern feminists need to preserve their group identity as the American Amish do by speaking a dialect of Middle High German (Jolly, P6S1-2).

Episteme (Mind Set)

The above reactions to *Primate Visions*, which show that these scholars reject Haraway, reveal a shared view on the meaning of science. These unfavourable reviews characterize a particular mind set: scientists' observations of nature (the physical world) and primates

corresponds to reality.[33] Rodman illustrates this point:

> Genes that replicate better than others are going to replace others, willy nilly. This fact (and I feel that Haraway trifles with her readers in trying to redefine "fact" (p.3) has nothing to do with how we *feel* about the world or how I *want* others to behave or with any ethical moral system . . . . There is no "nature" to act. Hrdy's mode of analysis: it is not a consequence of her past but the application of the cold eye of science to important phenomena of social life. Our culture provides a vocabulary for the real phenomena of antagonism and conflict as well as for cooperation, and this is the vocabulary of analysis of social life (P12S5-6 and P12S8-10).

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[32] For Betzig, the problem with Haraway's story is that it is written in the first person, and "it tends to be omniscient" (P5S1). Misia Landau, like all of the other primatologists who responded unfavourably, dislikes Haraway's language, which hindered her appreciation of some of the insights the book has to offer (P2S6). Furthermore, the metaphors only "reify the dualisms that [Haraway] seeks to disrupt", and this language surely cannot help the "poor, non-white women who could benefit from feminist anti-racist movements" (Landau, P11S9-11).

[33] Cachel argues that one should not yield to "myth making narratives" (P3S6). Not all science is socially constructed and not everything is related to capitalism as Haraway suggests (Cachel, P5). According to Small, "dominance and aggression are not figments of the male imagination. Fifteen minutes with any macaque group will convince even a novice animal behaviorist that these animals run their lives through a maze of dominant/subordinate interactions" (see all of P4). For Betzig, science should be without biases (P2S2); a reliable representation of science is needed (P4S3), rather than a history of science (P5S4). Cartmill believes that facts are independent of values (P19S11), and that there is a "real world" (P16S2). Furthermore, postmodern epistemology is considered problematic for Cartmill partly because it concentrates on historical circumstances, rather than the actual practice of science (and see also Cartmill, P1S8; P16S2)

How can some of the reactions be interpreted? For one thing, some of the reactions are obvious relational features portrayed as struggles between Haraway (and critics of science) and scientists. Jolly, for instance, believes that Haraway might be writing only for other postmodernists (P7). Dunbar writes that those who practice science will find it "frustrating" while the "less knowledgeable" will like it (P14). Landau comments on how few primatologists will be inspired (P12)[34].

As critical theorist Norman Fairclough (1989: 112-114) has shown, beliefs about content and knowledge can be "ideologically contested". For example in the body of book reviews, words that Haraway uses or ideas that she uses are "ideologically contested", and "hidden relations of power" become visible. One focus of an ideological struggle in the primatological discourse is the word 'relativism'. The word stands for a position and for underlying assumptions not condoned by many scientists. Postmodernist epistemology is often identified with relativism, both within and outside scientific circles, and in the case of the reviews written by primatologists/biologists, the word relativism was sometimes linked to postmodern epistemology. Associating postmodernism with relativism makes it simple to call Haraway a relativist. As we have seen other foci of ideologically contested ideas are that Haraway is considered to be antiscientific or unfriendly; she is thought to favour the permeation of boundaries such as nature/culture, science/non-science; she is considered not to be objective; her analysis is not about the real world; and the primatologists do not like her language. These themes are part of an overall realist and objectivist mind set.

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[34] Because this is an analysis in the meaning of language, I have presented many quotes from the book reviews to illustrate my points. Furthermore, often when I make reference to a book review or a statement in a book review when discussing a theme without interpretation, I will stick closely to the original text of the book review.

The Social Scientists, Historians, and Humanities Scholars: Alternative Views of Science

We will see below that many of the social scientists, historians of science and humanities scholars responded favorably to *Primate Visions*. There are several social scientists in this group, some of whom can clearly be called feminists: Lakshmi Bandlamudi (*Gender and Society*, 1991 and *The Graduate Student Advocate*, 1990), Hilary Callan (*Anthropology Today*, 1990), Sarah Franklin (*Journal of the History of Biology*, 1990a and *Times Higher Education Supplement*, 1990b), Joan Gero (*Women's Studies International Forum*, 1990) Deborah Heath (*American Ethologists*, 1990), Melinda Kanner (*The Anticoch Review*, 1989), Chris Nealon (*Z Magazine*, 1991), Elvira Scheich (*American Historical Review*, 1991), Louise Silverstein (*Journal of Sex Education and Therapy*, 1990) Susan Sperling (*Los Angeles Times Book Review*, 1989), Marylyn Strathern (*Science as Culture*, 1991), Caroline Humphrey (*London Review of Books*, 1990), and Micaela DiLeonardo *The Nation*, 1990). Other social scientists include James Tognoli (1990), George Marcus (*Science*, 1990), Larry Lohmann (*Ecologist*, 1993), and Clifford Geertz (*New York Review of Books*, 1990).[35]

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[35] Lakshmi Badlamudi [developmental psychology, gender (personal communication) - CUNY]; Hilary Callan (social anthropologist, gender); Sarah Franklin (anthropologist, cultural studies and feminist theory - Lancaster University); Joan Gero (archeologist, gender, feminist theory - University of South Carolina); Deborah Heath; [anthropologist, gender, politics, Africa (personal communication)- Lewis and Clark College]; Caroline Humphrey [social anthropology, gender, China (personal communication)- Cambridge, Kings College, UK]; Elvira Scheich[physics and political science, social studies of science, feminist theory (personal communication)]; Louise Silverstein [psychologist and feminist (personal communication)]; Susan Sperling

Of those in the humanities, some are clearly feminists. Gillian Beer, Carol Anne Douglas, Christine Gudorf, Margaretta Jolly, Sandra Harding, and Caroline Humphrey. Gillian Beer teaches English at Cambridge.[36] Carol Anne Douglas is an editor at *Off Our Backs*. Christine Gudorf teaches religion and philosophy at Florida International University.[37] Margaretta Jolly received her Ph.D. in Letters and is interested in cultural studies. She considers herself a feminist (personal communication). Sandra Harding received her Ph.D in philosophy in 1973 and has since then made a number of well known contributions to the literature on feminist critiques of science.[38]

The historians include Dorinda Outram, Margaret Rossiter, Lynn Nyhart, and Joan Scott. They are all feminists. Dorinda Outram teaches history of science at University College, Cork, Ireland.[39] Margaret Rossiter teaches history of science at Cornell University and has written about women and the history of science. Lynn Nyhart teaches history of science at the University of Wisconsin-Madison. She is especially interested in women in science and 19th and 20th century biology in

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[cultural and physical anthropology gender (personal communication)- Social Science Chaobot College in Hayward, California];
Marylyn Strathern (social anthropology, ethnography, gender UK; Melinda Kanner (anthropology, linguistics, history of science, women's studies). Micaela DiLeonardo (anthropologist, gender - Yale); Jerome Tognoli (environmental psychology, sex role development - Long Island University in Brookville New York). George Marcus (postmodernist anthropology); Larry Lohmann (politics, environmentalism, associate editor of *The Ecologist*, former staff member of "Ecological Recovery Thailand; Clifford Geertz (well known anthropologist).

[36] She is the author of *Darwin's Plots: Evolutionary Narrative in Darwin, George Elliot, and nineteenth Century Fiction* (1983).

[37] She has written *Body, Sex and Pleasure: Reconstructing Christian Sexual Ethics* (1994, Cleveland, Ohio: Pilgrim Press).

[38] She teaches philosophy at the University of Delaware and is well known for her book *The Science Question in Feminism* (1986).

[39] She has written *The body and the French Revolution* (1989, New Haven: Yale University Press) and *Uneasy Careers and Intimate Lives: Women in Science 1789-1979* (1987 edited by Pnina Abir-Am and Dorinda Outram, foreword by Margaret Rossiter, New Brunswick: Rutgers University Press).

Germany. Joan Scott is well known for her work on gender and history and has written about the importance of gender when writing about history. She teaches history and feminist theory at the Institute for Advanced Study. Micheal Neve is a historian of medicine and science in the UK at London College University, and Greg Mitmann is a historian of science.

Reflexivity

As we saw above, the primatologists who responded unfavourably share the rhetorical feature called minimal reflexivity. For the most part, the social scientists', historians', and humanities scholars' reviews do not have the structural feature of minimal reflexivity found in the primatologists and evolutionary scientists' book reviews. Instead, many of them are very reflexive and some urge scientists to become more reflexive.[40] Scheich for instance says that "critical self reflection on one's own historical and political position in science makes the difference" (P4S3). Another example comes from Bandlamudi who says that the "reflexive scientist will find the book to be both challenging and exciting, as it constantly invites interpretation from the reader (P10S4-8). Historian Joan Scott writes that *Primate Visions* "acknowledges that, while there is much scientific work to be done, scientists should always be aware that they are not simply studying Nature, but determining what it is" (P9S12). Historian Lynn Nyhart urges scientists, historians, and feminists to "grapple" with Haraway's radical proposal.

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[40] Some might argue that there are a few heretics present in this group of scholars who express uncritically extreme ideas about the meaning of science and may not fully consider the importance of what scientists think about the meaning of science. Uncritical, extreme views about the meaning of science, whether in a agreement or disagreement with Haraway's view of science, could be characterized as minimally reflexive.

The success of the social sciences depends on reflexivity and self conscious responses to social change. Reflexivity is also common to feminist versions of science. The feminists very much want to change traditional ways of thinking. Their total reflexivity is part of their alternative perspective on science. Many of the other scholars demonstrate a high degree of reflexivity because of the desire for social change and in response to social change. The primatologists/evolutionary scientists who express the predominant view of science do not see a need for drastic social change because they respect the authority of science.

The reviews written by the social scientists share underlying assumptions that are different than those of the primatologists. Even Clifford Geertz's review, which is unfavorable, questions more the idea of a feminist epistemology than the idea of whether science is socially constructed or not.[41] For example, he criticizes Haraway for her lack of method and for her genre of feminist theory, which is never clearly defined and remains "uninformed", and for her inaccuracy. He questions her ability to really show how feminism interacts with primatology. 'Why is primatology a feminist science?' he wonders. According to Geertz, the fifteen women highlighted by Haraway share only their focus on female animals, mothering, and receptivity. Rather than Haraway being the focus of attention here, the whole of feminist critique of science is, whereas in the primatologists' reviews Haraway herself, as well as her analysis, was more often the focus of contention. Geertz wonders about the progress of this kind of critique, and addresses this concern directly (and also see Geertz, P10):

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[41] His review shares one point of contention that is similar to the one discussed by the primatologists (who gave mixed and unfavourable reviews) and by some of the social scientists discussed below. He like the primatologists, questions her brand of social constructionism (P6), and the interplay between scholarship and popular culture (P5); however, he spends more time critiquing feminist models of science rather than social constructionism per se.

> How it [the feminist critique of science] will all fall out depends most on how the tension gets resolved between the moral impulses of feminism, the determination to correct gender-based injustice and secure women the direction of their lives, and the knowledge seeking ones of science, the no less impassioned effort to understand the world as it is, free of wishing, 'really is.' No one, it seems, is anywhere near doing that. But the issue is joined, and it will not soon disappear" (Geertz, P12).

The rhetoric of the social scientists, historians, and humanities scholars is quite heterogeneous, even though they share similar underlying assumptions, perhaps partly because there are several disciplines which represent the favourable view of Haraway. Like Geertz, many of the scholars openly question Haraway's use of evidence (e.g., Neve, Mitmann, DiLeonardo, Marcus), even though they think highly of her work. Furthermore, some admit to having problems reading her book because the language and theory were difficult.

Many of the reviewers discuss potential problems about what science should mean. That is, they praise Haraway's work, but do not simply accept it without involving themselves in the debate that Haraway speaks of. Many probe at the complexities of the meaning of science, feminism, gender, and the social world. For example, Caroline Humphrey wonders how feminism and science can really be compatible (see P9). She points out that the science as pioneered by men is not called masculine, yet science being reformulated by women and men is called feminist (P9). "What about gender neutral areas of study?" she asks. Marcus speculates about the limitations of Haraway's visions, and what kind of critique would be powerful enough "to alter the practices of the relevant scientists or to suggest viable new forms of inquiry?" (P2). Anne Russon, the primatologist who had a mixed reaction to *Primate Visions* also asked this question. McNeil (1994) points out the reflexivity in Haraway's work, thus pointing to her own: "Haraway steers an admirable path through the explosions of feminist critiques, the quagmires of relativism, the stagnant pools of empiricism and positivism, inspired by her feminist determination to insist on a 'better account of the world' (p.187). She will not let scientists off the hook, but she will not let feminists or postmodernists off either" (P7). The willingness to question their own place in the scholarship indicates the reflexivity of these critics.

Underlying Assumptions

The assumptions made by these reviewers are strongly related to one another, although the reviews were highly variable. In other words, the language of the social scientists is not precise; each underlying assumption blends into the other, and although the underlying assumptions of most of the reviews written by the social scientists are similar, their expression of them is heterogeneous. Because of the heterogeneity, it was sometimes difficult to find themes common to each review, but there are common underlying assumptions. So, it is more appropriate to discuss *underlying assumptions*, rather than *themes* per se. In contrast, the primatologists express themes as more precise, distinct, and unified. For example, their claim that Haraway is not objective can be clearly differentiated from their claim that she is a relativist. In abstract terms, we know that these two ideas are related to one another, but (discursively practiced) these themes are expressed as separate ideas.

Generally speaking, the underlying assumptions in the social scientists' reviews are the beliefs that Haraway is not an objectivist, relativist, or antiscientific. Haraway's claim that scientific and science fiction genres can be blurred is not used to suggest that Haraway is a relativist; rather, it is used to argue that blurring genres is necessary when studying what it means to be human. Many scholars discuss dialogics between nature and culture, or between science and popular culture, positively. Women and science issues are central to their reviews, both in the description of *Primate Visions* and as modality markers, where their opinions on the topic are voiced. Several believe that Haraway analyzes the real world, and most of the comments on language and writing style are positive. Finally, they express a particular mind set that is different than that of the primatologists' who responded unfavourably. One or more of the above underlying assumptions are present in each of the reviews written by the social scientists. All these assumptions combined could be said to represent another discourse on science: an alternative view of science, because they are in opposition to the conventional view. There are a few clear instances when the social scientists, historians, or humanities scholars are in direct opposition to the conventional view of science, especially when one of these reviewers speaks directly to a comment made by a primatologist. For example, Samuel Delany, the science fiction writer, does not appreciate a comment made by Dunbar. Dunbar said that he found the science fiction discussion (Chapter 16 of *Primate Visions* where Haraway reads primatology as science fiction and vice versa) a shortcoming of the book. Delany considers this unfortunate, especially because Dunbar did not fully understand

Haraway's use of science fiction for reading scientific texts (Delany, P26 and P27 where he also opposes some of Geertz's comments).

Haraway is not a Relativist

Recall that all the conventional primatologists/evolutionary scientists called Haraway a relativist or reductionist. Some of them qualified this label by associating postmodernism with relativism. This association is not entirely uncommon. A common criticism of postmodernism, feminist or not, is that it is relativist, and feminist postmodernists and modernists have often been opposed to one another for this reason. It is interesting, however, that many of the social scientists, historians, or humanities scholars do not call Haraway a reductionist or a relativist, and many of them do not label her as a postmodernist.[42] In fact, some of them go out of their way to express that she is not a reductionist or relativist; rather, she pays attention to the complexity of social life, and thus her analysis itself is highly complex.

Scholars who responded favorably discussed several points that support the idea that Haraway is not a relativist. First, they believe that she does not completely dissolve nature (what is) into culture (descriptions of what nature is) (Bandlamudi, 1991, P3S3; Heath, P1S1); she explores the *traffic* between nature and culture.

Second, she does not advocate that all science is myth and therefore cannot be judged. Haraway does want to show that scientific practice can sometimes be poor science, otherwise how would she be able to conclude that science *is* male biased

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[42] There are some exceptions. Geertz uses the phrase "social constructionism with a vengeance" to characterize Haraway's work. Neve has said that "not all scientific behavior is motivated by social factors" (P9) implying that Haraway believes this. Finally, the self pronounced postmodernist George Marcus happily believes that Haraway does relativize knowledge.

(Sperling, P8). For Haraway, science can be judged on the basis of facts *and* values. Gudorf, however, linking Haraway's analysis with postmodernism, states that the denial of a transcendental subject is problematic for grounding women's experiences (a common postmodernism criticism, see Nicholson, 1990). Gudorf asks if there is any given nature, and if there is not, how does feminism assign "value within experience" (P2S4 and P2S2).

A third way that some of the scholars illustrate that Haraway does not relativize knowledge is by positively discussing "situated standpoints" where the limits of objectivity are defined without losing the notion of objectivity altogether, a way out of the relativist trap. Harding, for instance targets "prevailing questions of objectivity" (P4).

> The consequences for thought do not lead simply to cultural relativity nor to the realization of an endless deferral of meaning. Haraway takes us from some of the preoccupations of contemporary narrativists. She is concerned with the fact that it is the groundedness and particularity of each place one occupies that enables one to move. One walks because one also stands; one can scan a whole epoch of scientific endeavor if one has the coordinating skill to focus on the detail (Strathern, P29S1-4).

Micaela DiLeonardo points out that Haraway favours poststructuralism and feminism over Marxism and realism and that she ignores the "Gramscian injunction to take oppositional ideologies into account when analyzing hegemony" (P13). Furthermore, Haraway uses post structuralism as a "smokescreen . . . to avoid a final negative evaluation of Sarah Hrdy's feminist sociobiology" but, Di Leonardo, in the end, points out that Haraway does not succumb to relativism because ultimately 'one story is not as good as another' (P13).

A final way that some of the social scientists show that she is not a relativist is by portraying Haraway as someone who, like scientists, simply wants to improve the way science is practiced. Sarah Franklin's review is especially revealing:

> Science is the stories we tell ourselves" is one way to summarize this position, which informs Donna Haraway's much awaited recent publication, *Primate Visions: gender, race and nature in the world of modern science* (Routledge, 1989). Examining the history of primatology as a case study in the cultural construction of scientific knowledge, Haraway urges us not to resist, but rather to seek edification from the temporality, sociality, partiality and specific locality of scientific knowledges. From Haraway's perspective, the prohibitions voiced by either side of the pro- and anti-objectivity camps are displaced by an invitation: to "read" our own techno-scientific discourses in *situ* rather *de facto* (Franklin 1990b, P4).[43]

By now it is clear that the eight primatologists/evolutionary scientists rejected her analysis partly because they considered her to be a relativist, and most of the social scientists, historians, did not. We are in a position to compare the two interpretations of *Primate Visions*. But before doing so, I will turn to Haraway's text to understand why the two interpretations are so different. Haraway makes few direct references to postmodernism, the school of thought used by some of the primatologists to justify that she is a relativist. For instance, on page 187 she says that "In his [early man's] humanist guises, he was assailed by postmodernism in the critical disciplines that used to speak for man"; on page 286 she suggests that the U.N. Decade for Women "should be read as a 'post-modern' phenomenon"; she characterizes sociobiologist Hrdy's work as a "direction " in "postmodernist, decolonizing bio-politics" (p.350 and describes this in more detail in pages 353-367); on page 309, she explores feminist ethnographer Marilyn Strathern's view on how modernism and postmodernism function in anthropology and ethnography; and finally, in a couple of footnotes on pages 400 and 428 she makes references to postmodernism in other people's work. Out of almost 500 pages, however, there are not many references to postmodernism. Furthermore, while discussing how a film, feminist sociobiology, and anthropology intersect with postmodernism, she *never* labels herself as a postmodernist, even though it could be argued that she selectively uses postmodernist ideas. As we saw in Chapter two, a cultural studies, feminist theory, critical theory label might be more appropriate for Haraway if we are to label her at all. Even in the first chapter where she discusses her four temptations (see Chapter 2 in this thesis), she does not call herself a postmodernist, and she is hesitant to side with either extreme realism or extreme social constructionist views (although some social scientists as we have already seen believe that she favoured social constructionist viewpoints, e.g., DiLeonardo, Geertz, Marcus). Gillian Beer, a feminist in English, says that "What Haraway shows is that sociology of science is not some optional extra, reductive in tendency. Though often resented as reductive by scientists, it here proves to be an important element in the constitution of knowledge" (Beer, P5S8-9). Margaretta Jolly expresses her concern clearly. She says that

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[43] Franklin also says that "even among the harshest critics of objectivity are some who argue that it is redeemable. Such redeemers are often most directly motivated by the specter of nihilistic relativism, threatened by the loss of any final arbitrator in the contest over truth. Others, concerned less with the specific content of scientific knowledge than with their disproportionate stature and authority, argue for something in between relativism and absolutism, in the form of a knowledge in context approach" (Franklin 1990b, P3). According to Franklin, "Haraway is interested in new ways of thinking about this traffic, not merely in deconstructing this cultural boundary. Her invitation is 'to remap the borderlands between nature and culture' (p. 25). However, neither edification nor pleasure will likely visit the reader to whom this boundary between natural science and the 'real world' is an existential, epistemological, or instrumental necessity" (Franklin 1990a, P6S1-3). Similarly, Nealon writes, Haraway is determined not to be mistaken here; discourse does not shape already-existing human material into various culturally bound manifestations of agency; discourse produces humans, creates possibilities for their existence. Which is not to say that there is nothing but discourse and language, or that there is no such thing as the material world. What she does argue is that everything, especially the physical world, is material for discourse. And that is why the book is so compelling: because Haraway's belief in the world creating power of language is at once intensely theoretical (that is, considered) and thoroughly grounded in the physical. As she puts it: "Stories are material practices; boundary conditions are not just structuralist fantasies, but potent aspects of everyday life. Discourses are not just social products, they have fundamental social effects (Nealon, P6).

> [When Alison Jolly opposes] the scientist to the artist, the attempt to discover against the desire to create, you misunderstand the essence of Haraway's project (P2). Far from proposing that all science is entirely relative or individual, she shows instead the wider social consensus that shape the scientific and the scientist. Whether or not particular scientific discoveries are true, or true to the best of our understanding at the time, they are ideologically constituted (P2).

The primatologists use postmodernism to call her a relativist when she does not call herself one in *Primate Visions*. In this respect, the primatologists are saying more about their own mind set and position than about Haraway's. The reviewers who responded favourably do not see the relativism in Haraway's work, but they do anticipate or react to negative comments made by the primatologists:

> Haraway's volume is also for this reason open to a variety of readings and misreadings. This openness is intentional - an extension of its own exhaustive intertextuality and emphasis on situated readings. It can, however, be mistaken for a radical exercise in cultural relativity - a depoliticized postmodern dispersion of standpoints from which to tell stories about ourselves and our origins. This is not Haraway's argument. She makes her own situated standpoint, her "investment" in primatology, clear in the conclusion: *Primate Visions* does not work by prohibiting origin stories, or biological explanations of what some would insist be exclusively cultural matters . .... "I am not interested in policing the boundaries between nature and culture - quite the opposite, I am edified by the traffic" (p. 377) (Franklin, 1990a, P5).

Science Fiction and Academic Discourse

Above, we saw that primatologists refer to Haraway's use of science fiction and "storytelling" as a way to justify calling her a relativist. Dunbar specifically found the science fiction material a drawback of the book. It is possible that Haraway confused her readers in Chapter 1, when she used the notion of "storytelling" while trying to redefine the meaning of the word "fact", and in Chapter 16 when she discussed the genre of "science fiction" in relation to primatology. Because of this, the primatologists may have dismissed her work from the beginning. According to many social scientists, historians, and scholars in humanities, science fiction and scientific genres must be blurred in Haraway's analysis because they agree that what it means to be human, one of Haraway's main themes, is defined by both academic and popular culture alike. Neve, a historian of science, however, thinks that Haraway does not adequately link her vision to the science fiction literature (P8 and P9). On the whole though, Haraway's analysis is seen as more than a chronological history of scientific practice; it is seen as a study of how humans are defined in the process of scientific practice. Susan Sperling writes that human problems are reflected in both the scientific accounts and popular images of non-human primates (Sperling, 1990:4, P1). The science fiction chapter is a display of Haraway's own literalizing strategy according to Strathern (P8 and see P27). Likewise, the exposition of scientific and popular culture is used to show the relationships of humans to other primates according to Kanner's review (P1S4). Many more examples of the positive reasons for blurring popular culture and scientific genres come from Callan (P4S2-7), Scheich (P2S1-5), Gero (P3), Kanner (P1S4), and Nyhart (P4S4-5). Louise Krasniewicz and Michael Blitz put it aptly when they say:

> Popular culture provides a vehicle for reading specialized culture because it taps into mythical stories about the natural and cultural "Others" that guide both types of discourse in their search for human meaning. Haraway uses King Kong and other icons of popular culture (Jane Goodall, *National Geographic*, museum dioramas, science fiction stories) in just this way (P2S1-2).

The primatologists also believe that Haraway used science fiction, postmodernism, and other literary strategies to permeate science. The social scientists, historians and humanities scholars find boundary crossing necessary in order to reconceptualize the meaning of nature and science, whereas the primatologists/evolutionary scientists who reacted unfavourably do not attempt to reconceptualize the meaning of nature or science. Instead, they accept conventional meanings of science defined by Neilsen earlier in this paper. Many of the feminists integrate cultural studies, feminist theory, and critical theory to show the connections between nature, culture, human, animal (Heath P1 and P9). Other examples can be found in Franklin (1990a, P6S1-3), and Silverstein (P4S5; P5S4, 7, 8; P6S5-6). Not surprisingly, the reviews written by Delany, Elkins, and Maddox, all science fiction experts, devote considerable favourable discussion to Haraway's use of science fiction.

Haraway is not antiscientific

The primatologists who share a conventional view of science saw Haraway as antiscientific and as an outsider trying to de-glamourize science. The reviews written by social scientists, historians, and humanities scholars are marked by the absence of the notion that Haraway is antiscientific. Indeed, in a few of the feminist reviews, efforts are made to show that Haraway is not antiscientific, and that her blurring of boundaries shows how her own literary style works (e.g., Strathern, P8, P27). In some instances, the reviews written by social scientists directly oppose comments made in reviews written by a primatologist. This reaction is seen in Bandlamudi's review:

> Yet it would be a mistake to treat this book as antiscientific. It is quite the contrary. In reviewing *Primate Visions*, Robin Dunbar (*New York Times*, 7 January 1990) felt that the less knowledgeable would be enthusiastic about this book, whereas the experts will find it frustrating. I take the opposite viewpoint. The reflexive scientists will find the book to be both challenging and exciting, as it constantly invites interpretation from the reader (Bandlamudi 1991, P10 S4-8).[44]

Strathern uses several euphemisms such as "frame of visions" and "displacement" to show that Haraway positively discusses a "science that seeks to know better" (Strathern, P26).

Haraway states very early that her book is written for a variety of people, including scientists. Again, I believe that the primatologists who responded unfavourably immediately dismissed her book, without seeing how it could be useful for scientists. In fact, Haraway thanks several primatologists, including the well known Sherwood Washburn for help.

Haraway is not identified as "not objective"

Many primatologists/evolutionary scientists who responded unfavourably argued that Haraway was not objective and therefore rejected her analysis. Several of the social scientists, historians, and other scholars, on the other hand, do not make this claim. In other words, they avoid identifying Haraway in strict dichotomous terms. Haraway believes in emancipation in the spirit of enlightened rationality, yet she wishes for the "death of the subject" advocated by postmodernists. She clearly exhibits her stance as a critical theorist when she discusses multicultural primatology, and rejects the polarization of objective and subjective analyses. Many of the reviewers see this. Her method is connected to her deliberate attempts to amplify her "political allegiances," and it is considered an example of the very point she is trying to make: politics and science are inextricably woven together in a complex "web" (Schiech, P2, Callan, P5S6 and P6, and Heath, P3).

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[44] Callan writes, "Towards the end of the book Haraway writes 'I do not think that deconstructive analysis of scientific narrative is hostile to biological science in its own terms, even if it is far from the same thing' (p. 356). This will have a disingenuous ring to some primatologists, even to those who neither want to preserve a model of science as a heroic encounter between the ahistoric human intellect and 'reality', nor suppose for a moment that animals can be simply 'observed' and 'described' in a discourse not always humanized in deeply culture specific ways" (Callan, P12S2-3).

Indeed, some call her work both "balanced", and "passionately" and "politically engaged" (Heath, 1990: 798-799). In other words, the feminists understand that Haraway is trying to redefine objectivity. Beer calls her analysis "gutsy," and Strathern wonders how you can separate being human from being partisan (see also Strathern, P5S11).[45]

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[45] Another example of Haraway's view of objectivity comes from Strathern's review. "But then the book is partisan. This is neither a distanced history that purports to describe 'other' events, nor a history from the inside that tells it the way it seemed to happen. It is pregnant with preferences. The important thing is the components of which these preferences are assembled: Haraway makes evident her own gender, culture, race and scientific status, and these are not components that can be easily fitted together easily. To be partisan means engaging all and each of them at the same time. It also means having an affection for what one does. The author treats her own work in a kind of third person: *Primate Visions* is referred to by its title several times, with characteristics that shift at each location in the text" (Strathern P6).

From Strathern's viewpoint, Haraway's subjectivity allows her to "see" better. Subjectivity does not stand in the way of seeing: "The process [of liberalization] constantly translates assumptions into objects of inquiry. What appeared at one stage as the initial grounding of an argument is then at another foregrounded, becoming the current focus of attention. In that process of foregrounding, assumptions lose their taken-for-granted status; the implicit becomes explicit. We are told at one point that the author has striven for a literal account (p.58). To be literal is to work on and open out knowledge of the world - to investigate the assumption behind the assumption. It gives a sense of movement (P7) . . . .The fine detail of Haraway's observations allow us to 'see' another movement. The unfolding of primate studies can itself be understood as a process of liberalization" (Strathern, P11 S5).

Franklin considers her approach to be exemplary:

> Most significant, however, for studies of science and sexuality (which constitute yet another level of *Primate Visions*) is Haraway's method . . . . A hallmark of her approach has been the particular way in which she draws together the history of science and cultural theory. The success of this combination derives both from the range of interpretive approaches it can knit together and the breadth of evidence that can be fed into the resulting analytical framework. The result is a distinctive hermeneutical practice that is both impressive and compelling. It is this method that enables Haraway to work at several different levels: from analysis of popular culture . . . to 'real science' . . . . It is also this multilayered technique that makes her prose extremely dense and eminently re-readable (Franklin 1990a, P4 S1-6).

Haraway received much fanfare here, but there were a few scholars who openly questioned her use of evidence and presentation (e.g., Di Leonardo, Neve, Mitmann). DiLeonardo, Neve, and Mitmann overall wrote favourable reviews, but they were also openly critical of *Primate Visions*.

Emphasis on the dialogic

The word "dialogical" takes on significant importance in the vocabulary of many of the social scientists, historians, and humanities scholars. If that word is not used, sentences used to describe the dialogical process are present. The alternative discourse emphasizes the dialogic relationship between primate scholars and primate subjects. This theme is strongly prevalent in the reviews (Gero, P4; Callan, P4S5-6; P10S2-3; Beer, P6S1, Franklin, 1990a, P2S4; Strathern, P2S4; Outram, P1S11; Scott, P1S2-6, P2S7, P3S7-9;). This reconceptualization of nature is common to feminist critiques and feminist models of science.

The Real World According to Social Scientists, Historians, and Humanities Scholars

Instead of suggesting that Haraway's book says nothing about the real world , like Robin Dunbar, the social scientists maintain the contrary. Their world is one in which science is influenced by context, by the processes whereby knowledge is socially constructed, by what counts as knowledge (e.g. Gero P1, Callan P8, Beer P3), by the meaning of nature (e.g. Callan P4), and most especially by redefinitions of the boundaries between human and animal (Silverstein). What it means to be human in light of the primates that occupy the crucial border between culture and nature becomes one of the important questions drawn from Haraway's book for the feminist social scientists, historians, and humanities scholars (e.g., Gero, P3, Calan P5, Strathern P13, P17, Silverstein P1 , Sperling P2, Beer, P1). Primatologists want to know what Haraway can say about the primate world. What establishes the "other" becomes the central concern for the many of the social scientists (e.g. Bandlamudi, 1991, e.g., p4 Callan e.g., p4, P5S4, Heath 1990, e.g., P4, Di Leonardo, 1991). Feminist reviews in particular perceive Haraway's "Other"/ subject of analysis to be the negotiation between the human/nature and culture/science borders and the ontogeny of scientific knowledge as influenced by gender (e.g. Callan, P1S1, 2, 4). Joan Gero voices this clearly:

> This book is both *all* about the study of primates and *really* about something quite different, rather larger. Haraway energetically wedges the history, sociology and philosophy of one particular discipline - primatology - into a brilliantly original postmodern study of how knowledge is constructed and semiotically coded in a field of meanings, primarily meanings of gender, race, class, and global, nuclear politics. . . . And more actively, "how may the people known as women and as scientists . . intervene in the construction of the potent natural-technical objects of knowledge called females?" (p.281) (Gero, P1S1,2,4).

A clear example of the way language is used to convey a strain in social relations is found in Sarah Franklin's reviews. Franklin, a feminist social scientist, disagrees with Dunbar, a primatologist. The problem with social relations is also related to Franklin's disagreement with a belief system that Dunbar expresses.

> Yet another recent take on the perennial "is there really a real world out there" question comes from Sheldon Glashow, a Nobel prize winning theoretical physicist from Harvard University and 25th annual Nobel conference participant. Glashow does not, like the "real science" reviewers of Haraway's book in *The New York Times* (January 7), simply insist that hers "tell us little or nothing about the real world" because, the reviewer argues, "in the long run, reality will win out" whatever Haraway or anyone else has to say about it . . . . .Such assertions that objectivity and the real world will be objectively vindicated by the objective facts in the end have a circular ring about them (Franklin, 1990b, P5; P6S1)
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> They, like a recent reviewer of Haraway's book, may bitterly conclude that it tells us "little or nothing about the real world" . . . .To readers like these, for whom science is a project dedicated to the proposition that "in the long run reality will win out" (Robin Dunbar, *New York Times Book Review* (January 7, 190), p.29, Haraway's project may well appear to be a misguided exercise. For others, who share Haraway's fascination with the endlessly edifying vicissitudes of the cultural categories through which we think ourselves, her book will tell us quite a bit about the "real world" in which we live and the many worlds imaginable within it (Franklin, 1990a, P6S4-6).

A certain mind set (episteme) can be found in these reviews. The feminist book reviews in particular are characterized by agreement on the social construction of knowledge that does not lead to relativism; on new ways of thinking about nature and culture that involve a researcher's engagement with her subject; on multiple meanings, self reflexivity and situated knowledge; on rejecting universal truths and accepting historically situated truth; on edification and making science better; and on emancipation. The degree of emphasis is different for each review.

For example, Franklin (1990b) says: "Haraway's claim that the proliferation of local knowledges and faiths can be endlessly edifying holds out considerable promise" (P7, S1). Callen likes the idea of situated knowledge, but wonders about how science can be better practiced (P4, P5, P12). Heath likes the linking of animal, human and machine and seems to favour the multivocality of which Haraway speaks (P9S3 and P7 respectively). What Nealon "loves" about *Primate Visions* is its "theoretical commitment to the power of storytelling, of discourse as a fundamental force in the scientifically and politically narrated world" without losing sight of the material world that disappears in language (Nealon P6S1 but see all of P6 and P7).[46]

Language/Style and Episteme

A number of the social scientists said that Haraway's book was difficult to read. Silverstein, and Sperling found Haraway's language unclear and found her book difficult to read. Humphrey does not like the postmodern jargon, representations upon representations, and believes Haraway does not provide enough information for a reader not familiar with the subject (P9). These comments are not unlike the ones made by the primatologists. Fuller (1993) suggests that disciplinary boundaries are "embodiments of knowledge" and "sources of worldly power", and that the "natural science can suppress the transformative character of knowledge production more effectively than the social sciences, by discourses that are relatively autonomous from ordinary talk, techniques, laboratories" (Full, 1993: 125). Indeed, several scholars consider Haraway's writing a challenge because she attempts to participate in the transformative character of knowledge, rather than suppress it.

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[46] Nealon pulls out a quote from Haraway that mirrors Foucault, stating discourses are not only social products but also have social effects (see Nealon P6). Furthermore, these discourses involve power relations. The limits of objectivity are shown through examples of non-Western primatology, which Nealon seems to agree with (P8), yet she finds the section on feminist primatology "so satisfying" because it offers " 'scientific' responses to the 'scientific" arguments that so many turn to as a last anti-feminist resort" (Nealon, P9S3).

Other reviewers who responded favourably did not have a problem with her language. Bandlamudi (P7 and P9), Heath (e.g., erudite, witty and challenging: P2), Beer and Nealon found her complex style of writing to be "thought provoking", "potent" and "vivid". Gero writes: "Each narrative is tightly woven into its political and semiotic context; all are read by Haraway for their placement in a deconstructed 'field of meaning' (Gero, P2, S3). Kanner notes that it was "meticulously researched, thoughtfully assembled and engagingly written" (Kanner, 1990:110).

Still others found that although the book was difficult to read, the language was not a major problem. Siverstein writes that "although Haraway's style can be obtuse her ability to interweave data . . . produces a humourous and often startling text" (P5S4). She also writes: "The complexity of thought and richness of detail makes *Primate Visions* difficult to read" (P5S1). Nealon writes that the "terminology is sometimes perturbing but generally an exhilarating admixture of scientific and literary language, made more accessible by Haraway's sensitivity to what she sees as her mixed audience (scientists, feminists, students, combinations of those) and by her sense of humor" (Nealon P5S2). She also suggests that the book is "intensely theoretical" and because of this readers need to put an effort into learning the terminology, otherwise they may not be content (P5S1).

Women and Science

Other than the specific disciplinary foci (e.g., Rossiter, P1S1; Outram, P4S4; Nyhart, P4; Mitmann, P6S2; Neve, P1S1), much of the variability in the reviews written by social scientists is evident when they discuss women and science issues.

Primatologists deal with epistemological claims about science and objectivity at a general level. Social scientists deal with the more specialized cases of these general epistemological claims about science and objectivity. Not surprisingly, they deal with issues that concern gender, science, and objectivity. The primatologists do not necessarily deal with these issues, unless it is part of their summary of Haraway's work. While I have illustrated some common underlying assumptions, I also pointed out some variability, both within and between the disciplines. This section serves to illustrate that although Haraway's work is praised, different aspects of women and science issues are highlighted, thus illustrating the heterogeneity in the reviews written by the social scientists.

Gero, in analyzing Haraway, discusses how "feminist restructuring" of natural and social life has offered "multiple insights", and how through dialogical processes women have focused on female primates *as well as* on male competition (P4). Gero raises the important question: What counts as knowledge for scholars who are *both women and scientists*?

For Callan, gender and race are essential "codes" because women and non-white persons have been both subjects and creators of Western discourse in describing nature and Man (P8): "Racial sensitivities are identified with post-colonial ones, gender becomes an ally for narrative deconstruction. Feminism indeed undermines the hegemony of primatological discourses at many points" (P9S2-3). Haraway's analysis of the roles race and gender play in scientific inquiry shows the historical specificity of different meanings of human and non-human (see P9). Feminist scholarship, for

Callan, helps us acknowledge different kinds of career styles and "conditions of success in research fields, and situated, biographical, gendered components of academic experience" (P9S6). She urges scholars to value pluralism.

This sentiment is not unlike Heath's description of Haraway's chapter on the four women primatologists. She writes that "These chapters speak to the multivocality of the intersection between feminist and scientific discourse" (P7S4). (While this is more a description of Haraway's book, than a marker of modality, it is by the context in which this statement is made that Heath agrees with Haraway.)[47]

Bandlamudi sees the issue of women and science a little differently. She seems to favor subjectivist accounts. She believes that feminists are demanding that subjectivity be given value, a valid point indeed; she sets up a polarization between the objectivist paradigm of the biologists and the subjectivist paradigm of the feminists (P1S2-3).

Sperling avoids this dichotomization altogether. Women have contested male centered accounts by emphasizing female agency (P7S4), but Sperling stresses that a good feminist story may not be good science (see P9). Female agency and subjectivist accounts are not privileged over good science, but nor are they ignored as tools that enable good science to be conducted. Primatological discourse explicitly separates subjectivity from good science. Sperling suggests that subjectivity is part of good science. Here she refers to Haraway's discussion on Hrdy, the feminist sociobiologist who, in emphasizing differences between males and females, shows how female primates are important in sociobiological frameworks. Maybe she is a good feminist, Sperling says, but sociobiology is nevertheless reductionist and not good science. The goal of doing good science is not abandoned.

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[47] Callan goes on to say that "these concerns are by now familiar, if contested, within anthropology; and in calling for them to be given voice and legitimacy in primatology Haraway incurs an intellectual debt she does not sufficiently acknowledge" (P9S9). The four women Haraway discusses "engage in problematizing *gender* by contesting for what can count as *sex*, that is, their reinvention of nature are part of their cultural politics. And all four set on stage a different kind of female primate self or subject to enact the crucial dramas. And each writer finds within the animals . . .a kind of sex and sexuality, and a kind of mind and cognition, appropriate to these variant subjects" (Haraway p.350 as cited in Callan P10S4). Multivocality is privileged.

Women's place in history allows them to see things differently, according to a number of the feminists. The women highlighted in Haraway's book "started from a different cluster of subject positions than those of their senior male colleagues" because they are women, white, and middle class (Beer, P4S3). This allowed them to see things differently (see P6). Starthern's discussion also highlights these women's particular place in history:

> Part III presents the scholarly biographies of individual scientists; they belong to one not both genders, to a particular phase in the history of their discipline and inhabit a world in which both their specific gendered selves and their study of specific gendered primate subjects have to take a stance with respect to universalizing theory that would sweep up specificities in the politics of difference (Strathern, P8S4).

Furthermore, Strathern stresses that there is nothing innate about gender; the differences between male and female are due to differences in "cultural, historical, and personal particularities" (P20S1, see also P20S6), not in terms of biology.

Strathern also points out that while the four women primatologists Haraway discusses share some common feminist goals, their differences are highlighted against "a background of cross-specific identity" ('femaleness') (P21S1). That is, these women have similar feminist concerns, but deal with them in highly different ways. For example, the four women Haraway discusses adopt positions where "the differences between the sexes are no longer taken for granted, though these writers [the four women primatologists] deal with it in very different ways" (P22S1, and also see P22S3-4).

Humphrey has a very different set of questions. She wonders how feminism and science are compatible. She points out that the universal science we know is not branded masculine, but bias is marked as feminist, which is seen to pollute science and 'What about gender neutral areas of study?', she asks (P9).

Jerome Tognoli's review revolves around the theme of how scientists and social scientists, including himself, have taken for granted how results and studies are informed by gender codes, racism, and anthropocentricism (P4, P6S3). He agrees that recently women primatologists have tended to see primates in more non-human terms, while men have tended to emphasize issues such as aggression (P6).

Thus, just as the four women primatologists Haraway highlights in her book have a common goal of restructuring science, but with different agendas, many reviewers who express alternative views have common goals of restructuring social science and scientific critiques, but with different emphases.

The Alternative View

The social identity of the alternative view on science is constructed through an identification with Haraway's work, and sometimes through disagreement with the primatologists' book reviews. This alternative perspective is in relationship to the conventional view of science because the former is in direct opposition to the latter. This has been referred to as "antilanguage" by Michael Halliday (1985). The conventional view on science is structured against Haraway. The conventional view of science seen here illustrates the Cartesian anxiety defined by philosophers of science as the propensity to construct modern debates, such as the one between scientists and critics of science, within "traditional extremes", especially objectivism versus relativism (Berstein 1983: 2). In Berstein's words, it encompasses the belief that scholars can only describe the world by objectivist and foundationalist means, or by relativist, and nihilist means (Berstein 1983:2). The alternative view on science appreciates dialogical thinking and research, and rejects the polarization between objectivism and relativism. Furthermore, it seems to me that many of the scholars that favour Haraway's view of science are saying, as Gadamer (1975) claimed much earlier, that reason cannot be separated from historical context. The criticism of the conventional view of science does not mean critics are necessarily relativistic because, in line with Habermas' critique of Gadamer, the alternative view expresses a cognitive interest that also has a practical interest (see Habermas in Berstein, 1983).

Habermas's (1971) explanation of the differences between symbolic interaction and rational-purposive interaction can help us understand the differences between the discourse types. Mishler (1986) has applied Habermas's terms to the differences between medical discourse and to what he calls the discourse of the lifeworld (medical patients' discourse). The discourse of the lifeworld uses symbolic interaction, which is structured by common ordinary language and behavior and is achieved through "consensual norms" (Mischler 1986; Habermas 1971). Purposive-rational interaction, on the other hand, is managed by "technical rules". and is based on empirical knowledge. Furthermore,

> While the validity of technical rules and strategies depends on that of empirically true or analytically correct propositions, the validity of social norms is grounded in the intersubjectivity of the mutual understanding of intention and secured by the general recognition of obligations (Habermas 1971: 92).

One characteristic of symbolic interaction is emancipation and communication without domination. On the other hand, a characteristic of purposive-rational action is the "growth of productive forces" and "power of technical control" (Habermas 1971: 93). The alternative view on science seeks emancipation through its opposition to the conventional view on science. By mastering technical rules (reliance on evidential criticism, for example), the scientists above can maintain their position as the conventional and predominant view on science.

Primatologists/Evolutionary Biologists and Other Scientists Who Gave Favourable Reviews: The Alternative View of Science

Two scientists who are also well known in the feminist science studies field (Anne Fausto-Sterling, Ruth Hubbard), and two evolutionary biologists/primatologists who are also feminists (Patricia Adair Gowaty (an evolutionary biologist - ornithologist who used to study primates), and Judith Masters)[48] responded favourably to *Primate Visions*. We might expect that the feminist scientists have a discourse somewhat reminiscent of the primatologists because science, rather than just primatology, is being challenged. All four feminist scientists agree with the conventional primatologists in their critique of readability (Gowaty P3; Fausto-Sterling, 1990, P9; Hubbard P11S2-3; Masters P12, P13). Hubbard adds that her use of literary criticism "erects an unnecessary barrier" (P11S3). Gowaty says that:

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[48] Judith Masters is an evolutionary biologist/primatologist who is a "feminist by necessity" (List of Contributors Section in *Women's Review of* Books, January 1990).

> *Primate Visions* is controversial and difficult to read. Some, though certainly not all, of the controversy must arise from the disturbing mirror that reflects an image of ourselves, not necessarily our own. It is difficult to read because Haraway uses endlessly long expressions, in contorted sentences, about very complex ideas (P3).

Other than this criticism, all the feminist scientists relate to *Primate Visions* positively. Unlike the primatologists who responded unfavourably and said that her analysis is distorted and not precise, Masters writes:[49]

> After my third reading of the book, I remained stunned by the depth, precision and innovation of her analyses (Masters, P1 S7).

Both Fausto-Sterling and Hubbard say that Haraway is not a relativist. Fausto-Sterling achieves this by pointing to Haraway's four temptations, one of the few reviewers to do this. In articulating temptation number one, she shows that Haraway refuses to accept the tendency in the social studies of science which rejects scientific notions of reality as well as the notion which proposes that knowledge is mainly a social construct (P5 and P4 respectively). What Haraway does, according to Fausto-Sterling (1990), is use the tools of the social constructionist position to critique and possibly improve science. She writes:

> Like Haraway I find an approach to science that examines the process of transforming "raw nature" into defensible "fact" through operations, machines, and finally diagrams and the written word, enormously revealing. Yet trained as a

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[49] In terms of writing style and her use of footnotes, Masters believes that some "real gems" are found in the footnotes of *Primate Visions*, but believes the book could have been organized differently, and that "tedious details" could have been eliminated, even though Masters realizes that including details was probably one of Haraway's intentions. Masters also did not appreciate the "ambiguous" and "unexplained terminology" (see P12 an P13).

> scientist (as was Haraway, who holds a Ph.D. in Biology), I do not find the so called strong program, the claim of a completely constructivist position, convincing. But also like Haraway, I wish to use the tools of these particular social scientists to provide critical analyses of how science works (P4S4-6).

Hubbard finds that Haraway is a "materialist" (P2S7) and that although she thinks that science and nature may be socially constructed, they are *real*; "they do not dissolve in the social relations that structure our view of them" (P2S8). Furthermore, near the end of her review, Hubbard remarks that Haraway does not see all scientific explanations as equal, for she has a clear preference, and that is that women have improved the way science is done by restructuring "what counts as evidence and explanation" (P12S6) and she does not privilege free floating discourses. However, Hubbard also comments that it would have helped if Haraway had drawn these issues together (P12S7).

The feminist scientists are rather delighted that Haraway has exposed the social construction of science. In the end of Gowaty's review, she says that "perspective may be everything" (P9S9). She foreshadows this in the beginning of her review:

> The first time I read *Primate* Visions I was on a sail boat. Bird watching through misty fog, I raised my binoculars to identify a gull sitting on the water less than 15 m from me. To my surprise, I was looking not at a gull, but a fishing boat! This memory about a trick of my senses, dependent on perspective, coincident with my first reading of *Primate* Visions reminds me of the book's lessons for me (P1S1-4).

Faust-Sterling writes that *Primate Visions* has changed her life (P1S1), that she can no longer enter the museum with a "child's mind" (P1S5), and now asks herself about hidden meanings of the meaning of nature (P1S8). She does not deny that Haraway challenges "supposedly objective versions of the truth", but sees that this can be positive for students of science as well as for feminists and historians (P3S3). Like

Nyhart, the feminist historian, she contrasts externalist and internalist histories and says that Haraway's standards will not be surpassed. She makes a plea to those doing history of science not to dismiss feminist approaches (see P6S4; P10)."As a feminist" writes Ruth Hubbard, "I am used to thinking about scientific descriptions of women's bodies as 'maps of power' on which masculinist scientists have inscribed their stories. Haraway has broadened this conventional feminist wisdom" (P5S2-3).

Furthermore, both Gowaty and Fausto-Sterling explicitly state that Haraway's book is not antiscientific. For example Gowaty writes: "In defense of Haraway's themes, I hope readers will notice that she does not claim that scientists have acted or are acting in conspiracy" (Gowaty P4). Gowaty also writes that "among the better meanings is the hope for *understanding*" (P7S1 emphasis added). Fausto-Sterling (1990) speaks not of anti-science but of having to contend with adult contradictions. "It is, I suspect, exactly the sort of conflict and dis-ease Haraway hoped to provoke in writing this book" (P2 last sentence). Masters refuses to see Haraway in dichotomous terms. In agreeing with Haraway, Masters says science is about objectivity *and* passions (P3S4-6). She states further that Haraway's seemingly disjointed discussion of both popular culture and academic culture is indeed highly intended, for this is the strategy Haraway uses to revolutionize our way of thinking about nature. Masters says this about Haraway's merging of two cultures in one analysis:

> The topics of the essays are extremely diverse, ranging from discussions of popular movies like the South African-made comedy *The Gods Must Be Crazy* to precise historical accounts of the use of primates as model systems of "human nature." This variety is part of a plan: Haraway means to revolutionize our perspectives, and she does this in part by the constant apposition of language and subjects from different worlds of experience (Masters, P3S1-2).

Women and Science

Missing in the reviews written by the conventional primatologists are issues about women and science. Haraway's focus on gender issues is a positive move for both women and science (Gowaty P8; Fausto-Sterling 1990, P6S2 and P8S9). Masters, for example, goes beyond the epistemological issues, such as traditional notions of objectivity, primatology, and relativism, raised by the conventional primatologists and evolutionary biologists. Masters appreciates how Haraway presents women as having "diverse interests and different agendas" for science, but their "commitment to feminism has led [them] to a common approach in restructuring primatology" (P9S2). She emphasizes the non-essentialist positions of the four women primatologists depicted by Haraway and the value of diversity. In the end, Masters believes that the section on the four feminist primatologists should be "compulsory reading" for those in anthropology and primatology (see P9).[50]

Interestingly, the two feminist primatologists/evolutionary biologists and the two scientists do not react the same as the primatologists who share conventional views of science. The alternative view of science is attractive to some feminist scientists perhaps because they are dissatisfied with conventional views of science

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[50] What Masters found "most significant and intriguing" were Haraway's two recurrent themes: the view that "chaos can only be held at bay by a social system based on the hierarchically ordered division of labour" and the allegory that nature provides the "foundation for ethics and morality", and support for inequitable forms of social organization (Masters, see P10 and P11). Exposing the "unseen nature of the dominant 'norm' in scientific writing" is one of Haraway's goals as Masters sees it (P11S2 but also see P10 and P11) and in the end, Masters feels Haraway has accomplished this.

Primatologists Who Wrote Mixed reviews

Vernon Reynolds, Anne Russon, Craig Stanford and Ron Dare appreciated some aspects of *Primate Visions*, but disliked other aspects.[51] There are several reasons why these primatologists had mixed reactions to *Primate Visions*, whereas eight primatologists/evolutionary scientists earlier responded unfavourably. Let us look at the aspects of *Primate Visions* that were similar to the alternative view of science. First, they are more *open* to alternative views in general. For example, many of the elements in Reynolds' review show that he looks upon Haraway's analysis favourably. In fact, he calls it a "masterpiece" (P1S1,S3) which "sustains a high level of professionalism". He likens her piece of writing to Constable or Rembrandt, and identifies his knowledge of the deconstructionist tradition with Henrietta Moore's *Feminist Anthropology*, which he admired. Stanford opens his review with the observation that there is a difference in reactions between what he calls the "deconstructionist minded postmodern ethnologists (with mixed but generally favourably reactions) and . . . the Darwinian minded primatologists (with thoughtfully and viscerally negative reactions)" (P1). Russon also acknowledges the different readings of *Primate Visions*: one is read as a deconstructionist history (the camp that wants to destabilize science), the other as espousing the perspective that science is reduced to mere social construction (the camp that wants to control the meaning of science (P23S1 and P37 and P38). Russon does not believe that it is either of these two views, but something more complex.

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[51] Vernon Reynolds' interests are primate biology and human biology. Anne Russon teaches at York University, Canada and is interested in social development of great apes and humans. Craig Stanford specializes in chimpanzee behaviour at the University of Southern California. Ron Dare has a background in biological sciences and anthropology and is interested in ecology and evolutionary theory of non-human and human populations. He has taught philosophy and logic courses.

Reynolds, unlike the primatologists/evolutionary biologists who responded unfavourably, does not believe that Haraway is a relativist, nor that she is antiscience. Not surprisingly, for Reynolds, natural phenomena can be "described and understood" (P9S3), hence the progress of science is possible: "Haraway does seem to come to a realization of this, for in her final chapters she accepts that the modern understanding of the centrality of female primates is in progress" (P9S5). Furthermore, Reynolds understands Haraway's idea of progress via feminist deconstruction, whereas the primatologists and biologists who responded negatively read feminist deconstruction as working against science. Paradigmatic shifts, social influences on science, the idea that progress is part of science, that natural phenomena can be described and understood, that the physical world interacts with the social world, and that scientists themselves are integral to change are main positive themes of Reynolds' review, which reflect an alternative view of science.

Second, this group of critics is more reflexive than the primatologists who responded unfavourably. Stanford actually urges scientists to be more self-reflexive:

> Some scientists are unwilling or unable to look beyond their data to acknowledge the biases that follow from the truth; the symptoms may prevent recognition of the disease. Most scientists would stress that falsifiable experiments, even if theories are socially constructed, are preferable to rhetoric as a means of arguing and as a way of knowing . . . . Lurking within this tortuous text is a message to which scientists everywhere should listen (P4).

Russon suggests that "Any coup lies in convincing the more extreme elements in both groups, scientists and deconstructionists" (P36).

Reynolds follows the same line of thinking. He feels that Haraway's analysis "sheds light" on how a school of thought influences a scientist's ideas, and that this becomes the justification for why Haraway's analysis is an example of the claims that she makes (P4S1): "Haraway's deconstructionist perspective is so well executed that she has shown up the limits of deconstructionism itself" (P10, S1). This point is not used by Reynolds to show that she is not objective, as it was used by the conventional primatologists. Reynolds is reflexive because he acknowledges the extent to which values influence scientific practice and the limits of objectivity. He draws on schools of thought like Henrietta Moore's deconstructionism and relates it to Haraway's work in order to comprehend it. Reynolds' acknowledgment of this is more than just minimal reflexivity. Instead of ignoring the limits of objectivity, he seems to suggest that scientists must work with these limits. While science is under scrutiny, is "de-glamourized" (P6) and is socially constructed via shared rules, Haraway shows that "the part of the social processes called science (or science fiction, if you will) is not just story-telling; it interfaces with the physical world as well". She is "harmless" Reynolds writes; while paradigm shifts occur, the shifts come from the scientists themselves he says. This could be interpreted as Reynolds does not see Haraway's work as a threat to science.

Reynolds interprets Haraway rather differently than the other primatologists, and actually enters into the debate over the meaning of science. Recall that Alison

Jolly (veteran primatologist who responded unfavourably) alluded to the idea:

> Of course scientists argue. Of course we are delighted to poke holes in others imperfect arguments. But to take just one example from Primate Visions, Jeanne Altman overturned established views by doing good science by the established rules, not just by separate pleading. Even if primatology arrives at some theory of uncertainty in which the observers' viewpoint is an explicit factor in his or her conclusions, that can take on the status of scientific theory only when the observers agree how they may communicate their positions to build up a coherent whole (P5).

Jolly (unlike Reynolds) uses the notion that a theory of uncertainty becomes a scientific theory because agreement is reached among scientists to show that Haraway has inappropriately cited imperfections in science, to suggest that it is socially constructed. In discussing coherence, Jolly strongly refutes the notion that science is completely socially constructed because Jolly believes that this is what Haraway thinks. Haraway would probably agree with Jolly, however, by saying that a theory is established within a scientific community. Reynolds discusses shared rules in the same sort of way that Jolly does to imply that science is not completely socially constructed, rather than to show she is a reductionist; he understands that this is what Haraway is trying to say. Instead of arguing against Haraway as Jolly does, he is arguing for her using the same strategy that Jolly uses. Jolly, Reynolds, and Haraway are saying the same thing when it comes to the scientific community determining what counts as a theory. Their difficulty in understanding each other is a good example of how communication gaps can occur during debate.

Some aspects of the mixed primatologists' reviews sound like the conventional view of science. Reynolds, for example, says that Haraway's analysis "does not touch on the real scientific enterprise", and that it does not help one comprehend the "non-human world". He uses metaphors like "demolish", "de-glamourize", and, in speaking in the third person about how other scientists might think about Haraway's work, uses phrases like "seeing their ship under attack" and "to return some fire and try to damage the enemy", all phrases similar to the ones used by the primatologists who responded unfavourably. Stanford also uses the word "attacks" (P2). Like the primatologists' language, Reynolds in Paragraph 9 discusses:

> That whatever the inequities of the scientific community . . . all these are powerless to affect the actual process of coming to understand the objects and relationships between objects in the physical world . . . There are reasons why human researchers cannot hope to agree generally about other cultures or even their own, including the intersubjectivity that characterizes human-human interactions . . . Primates and their actions are among the most complex and difficult natural phenomena to understand and describe, but in principle they can be described and understood.

Reynolds, like the other primatologists, does not want to see science de-glamourized. Furthermore, he thinks Haraway is very *selective*: "Criteria for inclusion are that one should have been interviewed by Haraway, that one should have a reasonable publication record in primate behavior, that one belongs to one school, or another within the subject, that one is a woman, that one should have written about female primates, their place in monkey society or in hominid evolution" (P2S2). Reynolds is criticizing her lack of objectivity, where objectivity is a criteria held by those expressing prevailing perspectives on science. Stanford, too, points to some errors in evidence and to her selective use of evidence, but realizes that it is "silly" to criticize her for this because objectivity is her target (P2 and P4). Furthermore, he believes that her "political flag-waving . . . infuriated" primatologists (P3). Russon also found problems with Haraway's objectivity; she selectively chose which primatologists' work she would discuss, and she favoured "outside" versions over "inside" versions (P26 and P32). But Russon ultimately understands why Haraway made the choices she did: Haraway wanted women who were reforming science while practicing feminism.[52] Dare found the book biased because it showed the limits of science; while he used positive language to describe Haraway's book, he ultimately believes in the "basic epistemology of science" (S5-10).

It could be said that these primatologists who had mixed reactions are a "dominated discourse type" (alternative views) "contained by a dominant one", (conventional views) (Fairclough, 1989:91).

Clearly, not all the primatologists wrote unfavourable reviews of *Primate Visions*. Although the primatologists/biologists share a common subject matter, their view of science is not common. Eight primatologists express a conventional view of science. Four express a mixed view of science (conventional and alternative). Two primatologists/biologists and two "other" scientists express the alternative view of science. Their reviews share more in common with reviews written by social scientists, historians, and scholars in the humanities. Their discursive community is defined less by the discipline of primatology, and more by their view of the meaning of science. The primatologists who did not respond unfavourably and did not express conventional (e.g., positivist) views of science wrote hybrid reviews. These primatologists were more willing to enter into the debate over the meaning of science and exhibited more reflexivity. The influence of alternative views of science (from the social study of science and feminist social study of science) is slowly influencing the field of primatology, and boundaries of knowledge are slowing being blurred. An explanation for *why* they wrote hybrid reviews is beyond the purpose of this paper. It is possible, however, to say that feminist theory quite likely influenced the scientists who are self admitted feminists.

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[52] Russon's review is an excellent example of the struggle between conventional views of science and alternative views of science. In other words, her review illustrates the blurring of boundaries of knowledge.

The specific ideas that have been borrowed and the ways they have been used is beyond the objective of the present analysis. However, Klein (1993: 187) suggests that there are six explanations for permeation:

> 1) the epistemological structure of a discipline; 2) relations with neighboring disciplines; 3) the pull of powerful fashionable tools, methods, concepts, and theories; 4) the pull of problem solving over strictly disciplinary focus; 5) the complexifying of disciplinary research; 6) redefinitions of what is considered intrinsic and extrinsic to a discipline.

The epistemological structure of primatology can be seen as "tightly knit", whereas the epistemological structure of feminist studies is more open. One can be a feminist and cultural anthropologist without great resistance from the anthropological community. It could be hypothesized that there is more resistance if you are a feminist and scientist.

The conventional primatologist reviewers engaged in boundary work which according to Geiryn (as cited in Klein 1993: 185) operates by three methods. The first method allows for the *"expansion of a professional authority or expertise into domains already claimed by other professions or occupations, thereby heightening the contrast between rivals".* We saw this clearly in the discourse of the primatologists and their reactions to Haraway, where discussions were cast in extremes, such as objective versus relative. Haraway was seen as a reductionist, whereas the primatologists saw themselves as objective. Describing Haraway this way heightened the contrast between these scholars. The second, identified by Geiryn is the "*monopolization of professional authority and resources, thereby excluding rivals from within by defining them as outsiders who are 'pseudo,' 'deviant', or 'amateur'*". We saw this when the primatologist reviewers cast her as an outsider and as antiscientific. The third method is "*protection of autonomy over professional activities, thereby exempting members from responsibilities for consequences of their work by putting blame on the scapegoats from outside*". This is one of Haraway's main points. Scientists who discover and produce knowledge must act responsibly instead of saying simply "well this is what I found, it is reality". The reviews written by the feminist scientists show signs of permeation. They also seem to believe that knowledge is historically situated; they reject universalizability but not objectivity.

CHAPTER V

CONCLUDING REMARKS

Overview of General Conclusions

In this paper I have discussed Haraway's views of the science of primatology, particularly as they appear in her book *Primate Visions*. I have shown how I conducted a textual analysis, using Foucault's concepts as a guide. A more critical analysis would involve looking at how discursive practices and discourse are linked to wider social and cultural structures (e.g., Gunther 1985), a task not undertaken in this paper. Peter Fairclough (1993), a critical discourse analyst, offers some direction for this kind of analysis:

> By 'critical' discourse analysis I mean discourse analysis which aims to systematically explore often opaque relationships of causality and determination between (a) discursive practices, events and texts, and (b) wider social and cultural structures, relations and processes; to investigate how such practices, events and texts arise out of and are ideologically shaped by relations of power and struggles over power; and to explore how the opacity of these relationships between discourse and society is itself a factor securing power and hegemony (Fairclough, 1993:135).

My analysis showed the reactions to *Primate Visions* of scholars in different disciplines and examined the views of these scholars. Reactions to *Primate Visions* showed that a debate between those who express a conventional view of science and those who want to change the conventional view of science is still alive and well. That is, a controversy over the meaning of science still exists. The controversy, in general, might be characterized as a debate where the meaning of science is being negotiated amongst different scholars. Indeed, the reviews written by the feminist primatologists/evolutionary biologists and other scientists illustrated a blurring of boundaries of knowledge, resulting in an alternative meaning of science. The controversy could also be characterized as a "dialogue of the deaf", a dialogue where the meaning of science is not negotiated. The latter debate involves scholars from incommensurate "camps" or "viewpoints", who talk past one another. Comprehending reactions to Haraway's critique of science and comprehending the nature of the debate in its contemporary form has been the objective of this thesis.

I would like to summarize some of the reactions to *Primate Visions*. At a superficial level, I was able to show the reactions to *Primate Visions* by overall response, disciplinary affiliation, and feminist orientation (Table 1). Primatologists (and evolutionary biologists) for the most part, wrote unfavourable reviews of Haraway's critique. Reviewers from all other disciplines, with the exception of Clifford Geertz, received the critique favourably. The favourable reception did not seem to be influenced by the adoption of a feminist orientation. In the case of primatology, the only two favourable reviews are written by feminist scientists. Two other feminist scientists also wrote favourable reviews. Four of the fourteen primatologists wrote mixed reviews, the only mixed reviews in the corpus. These, however, did not seem to be affected by a feminist orientation.

I also showed shared reactions to *Primate Visions* and shared viewpoints which I interpreted as discourses (discursive communities). Generally speaking the primatologists who responded unfavourably expressed a conventional view of science. That is, the debate was constructed by extremes: relativism versus objectivism. Science is considered very different from non-science. This view emerged from some of the features in their book reviews. Their reviews shared several features. They were not wholly reflexive. They characterized Haraway as a relativist and as antiscientific (or as an outsider). Some linked her critique with postmodernism. They shared the belief that there are boundaries to knowledge and that scientific knowledge is very different than other forms of knowledge. They thought that Haraway should focus on the primate world without connecting it to the human/social world. Finally, they believed that Haraway's language was obtuse.

Generally speaking, most of the other scholars who responded favourably expressed an alternative view of science. For example, an alternative view of science avoids dualisms, such as relative and objective. They see science as connected to the real world, and they see that new meanings of science can arise when one goes beyond traditional disciplinary boundaries. Scholars who responded favourably, for the most part, were more reflexive than those who expressed the conventional view of science, and many urged scientists to be more reflexive. They did not label Haraway as a relativist. Many saw her as someone who tries to avoid relativism and extreme objectivism. They did not call her antiscientific. Some showed that she was genuinely trying to improve the way science is practiced. Many scholars felt that the reason Haraway discussed all kinds of knowledge about the primate world (popular culture and academic work) was to show how new meanings of science could arise. Furthermore, many of the favourable reviewers saw science as connected to the real world. That is, they saw that science was indeed influenced by social and cultural values. Finally, although some took exception to Haraway's highly theoretical language, many did not highlight it.

The primatologists who responded unfavourably may have misinterpreted Haraway partly because Haraway's text invites multiple interpretations. Haraway does not see herself as a relativist or as antiscientific; many of the scholars who responded favourably did not see her in this way either. Several believed she wants to improve science, not demolish it. Furthermore, Haraway has not labeled herself a postmodernist, yet some of the primatologists who responded unfavourably linked her critique of science to postmodernism and then linked it to relativism. Some of the scholars in the other disciplines also situated her in postmodernism, and questioned her agenda, but did not link her to relativism.

The primatologists who wrote mixed reviews shared discursive practices that were in some ways similar to conventional primatologists who responded unfavourably. Yet, mixed reviewers had much in common with the scholars who responded favourably and who held an alternative view of science. That is, they referred to older models of science, but saw the promise of new alternative frameworks of science, such as Haraway's. The feminist scientists who wrote highly favourable reviews blurred boundaries of knowledge; as practicing scientists, they favoured alternative views of science over predominant conventional views of science.

The Contemporary Debate: "Science Wars"

Recently the debate, or the "science wars" as some prefer to call it, has been featured in popular magazines. Sharon Begly in *Newsweek* (April 21, 1997) opens with "How much is research influenced by political and social fashions? An important debate is making scientists re-examine their assumptions of objectivity" (p. 54). Colin

Macilwain in *Nature* (May, 1997) writes " 'Science Wars' Blamed for Loss of Post" (p. 325). The article reports on a failed appointment of a historian of science supposedly because of his affiliation with the science studies discipline. These wars are not likely to disappear in the near future.

Improving Communication

How can communication be improved? Anne Seller, a feminist philosopher, offers some suggestions for improving communication between different groups of scholars (1988). Seller wishes to settle the conflicts between feminism's commitment to politics and philosophy's commitment to reason by showing that politics and reason should be given equal attention. In more broad terms, she wishes to settle the conflict between relativism and realism by calling for a more democratic epistemology, so that they can work together. Because Haraway and most scholars other than the primatologists/evolutionary scientists who responded unfavourably do not consider Haraway a relativist, there is no debate between relativism and realism per se. There is a conflict, however, between alternative and conventional views on science. However, the primatologists who responded unfavourably do label Haraway a relativist. She and they are involved in a debate between relativism and realism.

Seller's attempt to show how different perspectives can work together is useful. A democratic epistemology works by first acknowledging that there are problems with all kinds of perspectives. According to proponents of alternative views of science, the problem with realism, is that it is "undemocratic", "elitist", and it is an "exercise in domination". Understanding control and power is pivotal in understanding how it is that scientific authority is "worshipped" (Seller, 1988: 172-173). In the conventional view of science the problem with relativism is that progress cannot occur without saying what is right or wrong. Haraway has already realized this, as have most feminists and other scholars.

Seller borrows from Habermas the idea that control is achieved through perfection of technique rather than through democratic means in the scientific enterprise. For Seller, when we realize that knowledge is shared and that there are many ways to know how the world operates, we will realize that there can be an exchange of knowledge between individuals or groups.

No one wants to accept a view which does not match their experience, according to Seller. One test of a particular view is its acceptance by the community. Seller believes that false views are found when views and experiences are shared (176). The scientific community decides how and to what degree facts and values can be mixed.

Therefore, conversation allows the "truth to emerge" and frameworks to develop (179). Discussing individuals' experiences can help the realist find the truth and the social constructionist to contribute to the construction of reality; the difference between two perspectives becomes less important (182). Others (Hesse 1994) have suggested that there be a "recognition of flexibility of theory and method" where there are "bridges between the 'hermeneutic' [human sciences] and the 'empirical' [natural] sciences". Ian Neilsen has suggested that scientists need to be "socio-political[ly] and historical[ly] self conscious" (1987).

Nevertheless, we can no longer afford debates between scientists and critics of science without conversation and discussion. For example, the primatologists who hold conventional perspectives on science might be able to point out false beliefs in Haraway's work or in the work of other critics of science, which is persuasive for other primatologists who hold that same perspective, but pointing out false beliefs will not necessarily work for the committed feminist or scientist with an alternative perspective on science. Pointing out the problems with realism or with the scientific community may not especially appeal to the scientific community. Therefore, a debate over episteme is not particularly effective when two mindsets are perceived as incommensurable based on misunderstandings or misreadings of different perspectives. Opposing definitions of the "real world" could be said to represent incommensurate viewpoints. As Seyla Benhabib points out:

> My answer is that the less we view such discourses along the model of public forum or courts of appeal, and the more we understand them as the continuation of *ordinary moral conversations* in which we seek to come to terms with and appreciate the others' point of view, the less do we submit to the distorting lens of procedural universalism . . . . Each time we say to a child, "But what if other kids pushed you into the sand, how would you feel then?", and each time we say to a mate, or to a relative, "but let me see if I understand your point correctly," we are engaging in moral conversations of justification (Benhabib, 1990: 358).

Therefore conversation and team work are essential. This has recently begun. In 1996, primatologists Shirley Strum and Linda Fedigan co-hosted a conference in Brazil where "science studiers" and primatologists met and talked, the first meeting of its kind.[53] Their main goal was to understand what factors have influenced changing views of primate society. They found that scientists and science studiers hold very different views of what science is. Nevertheless, a meeting of this kind, where scholars from different disciplines exchanged ideas, could be considered a step in the right direction for improving communication between scholars with different views of science.

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[53] SC Strum and LM Fedigan are editing a book, which includes papers from the conference (SC Strum and LM Fedigan (eds.). In Press. *Primate Encounters: Animals, Scientists and Science.* University of Chicago Press.

APPENDIX A
EXAMPLE #1 MANAGEMENT OF A SINGLE REVIEW

I will assess Alison Jolly's book review. Because her review is short and relatively non-complex, it provides us with a brief and simple illustration of how an individual book review is assessed.

P1S1 ***Primate Visions*** **is ostensibly about women primatologists, but it takes a devious route.**

S2 **Donna Haraway's theme is the disintegration of the male white imperialist view of nature.**

S3 **She begins with Carl Ackeley and Teddy Roosevelt parading across Africa, followed by a train of more-or-less faithful wives and bearers, and ends with the multicoloured science fiction of Octavia Butler.**

This paragraph is a description of *Primate Visions*. A description of *Primate Visions* is common in many of the reviews. The phrase "devious route" could be categorized as objective modality, but it can be read as a positional comment on how Haraway deviates from some normative order.

P2S1 **Carl Ackeley marshaled armies of taxidermists, painters, botanists, porters and hunters to create the African dioramas of the American Museum of Natural History.**

S2 **The dioramas are works of art, not of nature, says Haraway, made of the skins and horns of dead animals in a painted cave.**

S3 **But Ackeley still has his hand on the nape of the visitor's neck, forcing you to see his vision of Africa as the only true reality.**

This paragraph is further description of *Primate Visions*.

P3S1 **By the late 1980s, Haraway's primatologists study female primates as more fundamental to their troops' reproductive economy than the males.**

S2 **We emphasize individuals' strategies of friendship and aggression, breaking down even categorization by sex.**

S3 **We spend much energy on conservation, not pure science.**

S4 **Conservation means understanding the viewpoints of collegues, politicians and villagers in our host countries, who will determine the survival of their monkeys, apes and lemurs.**

S5 **We are trying to keep our wild relatives afloat in a current that sets inexorably towards the future.**

Paragraph three is further summary of *Primate Visions*. The use of the pronoun "we" and "our" signifies inclusion and could also signify expertise in the field of primatology. In paragraphs 1-3, Jolly shows that she understands that the focus of primatology has changed throughout history.

P4S1 All this is true.

S2 But Haraway still gets us primatologists wrong.

S3 This is an ambitious book.

S4 Haraway does not just try to describe changing fashions in science, or external influences.

S5 She says that studying creatures is as much like us as wild primates is a matter of personal vision.

S6 She analyzes field primatology as though it were science fiction.

S7 Fragmented views of baboon or lemur need never rejoin, anymore than you would to reconcile Warhol with Canaletto.

S8 Haraway does not accept the effort of science to discover, not merely create.

P4S1 shows superficial agreement with Haraway and minimal reflexivity. Jolly, however, uses the word "but", a key word in argumentation, to begin her counterclaim that Haraway "gets us primatologists wrong". Again, she uses a word ("us") to signify inclusion and expertise in the field of primatology. S3 is a compliment, followed by a series of criticisms in S4-8. Haraway is considered an outsider who does not know the field of primatology and she is perceived as an extreme social constructionist (S6 and S8). Jolly does not appreciate the "science fiction" analogy, probably because she believes that science fiction and science are not the same thing.

P5S1 Of course scientists argue.

S2 Of course we are delighted to pole holes in others' imperfect arguments.

S3 But to take one example from *Primate Visions*.

S4 Jeanne Altmann overturned established views by doing good science by the established rules, not just be separate pleading.

S5 Even if primatology arrives at some theory of uncertainty, in which the observer's viewpoint is an explicit factor in his or her conclusions, that can take on the status of scientific theory only when the observers agree how they may continue their positions to build up a coherent whole.

For Jolly, good science is equivalent to consensus within the community (S5). The authority of science is not threatened because scientists determine what is scientific and what is not. Haraway would probably agree with S5. However, in believing that Haraway is an extreme social constructionist, Jolly believes that Haraway is speaking ill of primatology. In S4, Jolly states that there *are* established rules in primatology and not separate pleading. To defend science in this way suggests that Jolly thinks that Haraway is someone who *does* believe that science is "separate pleading". Interestingly, I doubt that Haraway would disagree with Jolly's 4th and 5th sentence. In fact, this is precisely one of Haraway's points. Longino (in Longino and Hammonds 1990) has suggested that Haraway does believe that science is "rule governed". In this sentence, I think Jolly and Haraway are not opposing, yet having set Haraway up as an extreme social constructivist who believes that science is "personal visions", Jolly has to disagree with Haraway.

P6S1 Primate Visions is written in armour-plated post-modern feminist jargon.

S2 I can see no intellectual excuse for this, but I can see a social reason, if postmodern feminists need to preserve their group identity as the American Amish do by speaking a dialect of Middle High German.

S3 Perhaps Haraway is so defensive because she senses that the scientists she treats with such care and close reading are going to reject her.

Jolly criticizes Haraway's language and again casts her as an outsider. Jolly, as a scientist, distances herself from Haraway, the social critic. In doing so Jolly labels her a postmodernist. Jolly anticipates that many primatologists will reject Haraway.

P7S1 Margeretta, you have tried so hard to educate me about postmoderism and I am not sure it has worked.

S2 Haraway also once tried to make it clear to me.

S3 She explained it as seeing the world as a mirror-glass skyscraper, which reflects a kaleidoscope of sky and other buildings and the observer's eyes, and which changes its reflection as soon as the observer shifts her own standing place.

S4 Maybe so.

S5 But some of us still believe that if enough scientists stand in different places, and on each others' shoulders, we'll get past the games with mirrors to describe the building itself.

S6 But perhaps she is writing *about* us only *for* you.

The content of this paragraph illustrates Jolly's beliefs about knowledge and what she considers Haraway's beliefs about knowledge. Jolly tries to understand Haraway's point of view in P7S1-4. Jolly believes that Haraway's point of view is postmodernist, a point of view where reality constantly shifts and changes (S3) In S5, she begins with "but" to show that her own view is different that Haraway's, a point of view where reality is transcendental, accessible, and tangible (S5). Jolly sets up a polarized scenario of viewpoints. Postmodernism and science are seen as incompatible. In S6, Jolly characterizes Haraway as an outsider in writing for other postmodernists. Jolly shows that she is the insider with the use of the word "us" (S6).

Thus, there are several key reactions in this review. Jolly believes that: first, Haraway is an extreme social constructionist who sees science as science fiction, as personal vision, and as separate pleading; second, Haraway's language is considered problematic. third, Haraway is writing for postmodernists, not scientists. and fourth, boundaries of knowledge should not permeate (science fiction and science are considered to be different, as well as postmodernism and science). Fifth, Jolly shows that she tries to understand Haraway's objectives, but in the end, Jolly's view of science is that there is a transcendental reality and that she opposes postmodernism.

EXAMPLE #2 MANAGEMENT OF A SINGLE REVIEW

The second example comes from primatologist Susan Cachel. The first three of ten paragraphs are used for a very brief illustration.

P1S1 Primates appear in this book as objects of ideological contention.

S2 The chapters cover the history of primatology from the beginning of this century, punctuated by chapters concentrating on individual primatologists.

S3 This book is aimed at a popular audience and is on sale at nationwide bookstore chains.

S4 It is also aimed at disciplines other than anthropology - it is being used in courses in the English Department at Rutgers, for example.

S5 Professionals will find this book interesting to read, but infuriating.

S6 This is not an objective account of the history of modern primatology, and the special biases are not subtle.

S1 and S2 are fairly descriptive. S3 and S4 illustrates that *Primate Visions* is for other audiences besides primatologists. S5, especially the word "infuriating", is an introduction to the mood of the review. Cachel provides evidential criticism by clearly saying that *Primate Visions* is not objective. This is one reason to reject Haraway.

P2S1 Much of the book is a jeremiad against science, and so, perhaps professionals other than anthropologists should find it disturbing.

S2 There is no objective reality against which to gauge scientific ideas.

S3 All science is relative, and primatology is a discourse or text subject to local interpretation.

S4 "Evidence is always a question of interpretation; theories are accounts of and for specific kinds of lives ...

S5 Primatology seems to be a science composed of stories, and the purpose of this book is to enter into contestations for their construction" [p.8].

S6 The author clearly believes in Kuhnian paradigms in their most extreme presentation.

S7 The social milieu, not the accumulation of disrupting facts, offers reasons for accepting one paradigm over another.

S8 Primatology is not science but narrative or story telling.

S9 The author interprets "texts" and "subtexts" in the way that literary critics offer readings or multiple perspectives on a text.

S10 The idea that facts should be the focus of attention is foreign to this book-the author treats "facts," instead.

S11 One theory is as valid as another, and there is nothing to check or constrain narratives except personal taste or political agendas.

Cachel characterizes Haraway as antiscience and finds her book "disturbing". S2 is evidential criticism. S3 qualifies S2 by labeling Haraway's work as an exercise in relativism. Cachel uses a quote from Haraway's work in order to substantiate her claim. S6-S8 and S11 further substantiate Cachel's claim that Haraway's work is an exercise in relativism. Cachel in S3, S9 and S10 does not seem to appreciate Haraway's goal which is to examine texts, and she does not seem to appreciate that literary criticism has anything to do with primatology. Cachel feels Haraway should be studying facts not re-defining it. Cachel could be said to be engaging in boundary work, where science should not be subject to literary criticism. The content of this paragraph reveals three points of contention: Haraway is antiscience; she is a relativist; and she inappropriately crosses boundaries of knowledge.

P3S1 Haraway attempts to move physical anthropology (specifically primatology) into the realm of literary criticism.

S2 Much of modern cultural anthropology has succumbed to interpretive/symbolic stances of this sort, and post-processualist archaeology has also fallen prey to fashionable post-modernist relativism.

S3 Cultural relativism as an idee fixe and a lack of interest in material culture may be responsible for the orientation of much of present-day cultural anthropology.

S4 Cultural anthropology folded to literary criticism without a pronounced struggle, but the battle lines are drawn in archaeology.

S5 This book wants to herald the beginnings of a skirmish in physical anthropology.

S6 Developing research strategies and finding reasonable explanations for data is difficult, but, unless one relinquishes any claims to science, one should not yield and settle for myth-making narratives alone.

S1, S2, S4, S5 reiterate Cachel's disapproval of genres being blurred. In her view, literary criticism does not belong in anthropology. Postmodernism is associated with relativism and with Haraway. Phrases or words such as "battle lines", "struggle" and "skirmish" reveal an unfavourable position and thus are subjective modality. S3 and S6 equate Haraway and her brand of literary criticism to relativism, without questioning whether Haraway's work might be more complex. Cachel has no difficulty rejecting Haraway if she is perceived as a relativist. Clearly, Cachel does not agree with relativism, and because she believes that Haraway advocates that all science is relative, she does not agree with Haraway . Cachel continues her criticism of relativism in the first sentence of paragraph four. **(P4S1 Haraway believes that all science is relative, but political agendas are not.)**

Appendix B Commonality of Conventional Primatologists Reactions By Reviewer and By Theme of Reaction

Reviewer by Theme	Susan Cachel	Meredith Small	Alison Jolly	Robin Dunbar	Matt Cartmill	Peter Rodman	Laura Betzig	Misia Landau
Haraway is a Reductionist	P2S2-7, P2S10 P3S6, P4S1, P3S2-3	P4S1-2	P4S4-8	P9S1,S4, P10	P12, P7, P4S3-4, P18, P2S57,P3S13, P4S6, P5S2-7	P10, P11S1		P12esp.S4-7, andS11
Haraway is antiscientific, not writing for scientists	P2S1, P5S4, P6S3	P6S2, P6S6	P7S6	P11S5	P4S3, P2S3, P16S1,3,4, P16 P8S2, P17S1	P3esp.S3, P8S1		P1, P6S1, P6S3, P7S1, P8, P12S8
Is against the permeation of boundaries	P2S8, P3S1-6, P10S7	P3	P4S6	P5S1-2, P6S2-4, P11, P12S1-2	P3S1-3, P5S2-7, P15S8-10			
Haraway is not objective (flaws)	P6S2, P1S6, P2S2, P10S3, P6, P4	P3, P5S1-9, P5, P4S5-7		P4S2, P7, P9S4, P13S1-3, P14S5, P11	P8S5, P15, P1S2, P4S2-3, P8S1,5,P13S4 P14, P4S4-6	P5S2, P6S4, P13esp.S2, P10S7-8, P3S2, P10S3	P2S4, P4S4, P4S5, P5S2	P4S1, P6S2, P7S1, P8S9, P11S1-2
Haraway doesn't talk about the real world	P2S9, P8	P2S6, P3, P6S2, P6S-10	P1S1, P7S6	P4S2, P2, P13S3-4	P2S5-7			P2esp.S3
Language problem	P10S1-5, P10S5,6,8	P2S7, P6S1,4-5,7	P6S1-3	P5S3, P12S3-4	P3S5-6	P10S1 (very interpretive)	P5S1	P2S6, P11S9-11
Examples of reflexivity	P9 likes Japanese prim. section reflexivity?	P1, P2, P5S7	P1, P2, P3, P4S1-3	P3, P4	P12S1,2,3 P2S4-5	P12	P2esp.S1, P3S1, P3S6-7, P4S1-2	P3S3-6, P11S8
Mind set	P6S6?, P3S6, P10S8?	P4	P7, P5	P6S5-6, P9, P13S5	P10S2,P12S3, 4,P12S6, P16S2,P19S11 P19, P21S1		P2S2, P4S3, P5S3, P5S4	P10esp.S2

APPENDIX C

Rhetorical Organization of Vernon Reynolds Mixed Review: The Mixed View of Science

Reactions Characteristic of the Alternative View	Reactions Characteristic of the Conventional View
Reynolds likes Haraway's style and calls her work a "masterpiece" (P1)	He also writes that the book was not "normal", and that she wants to "demolish" and "deglamourize' science. She is also considered "selective" (not objective). He uses adjectives similar to those used by the primatologists who responded negatively.
Yet, she sheds light. Reynolds considers the influence of social factors on scientific practice by saying that her work exemplifies this. Her work is not used to show that she is not objective.	
Haraway's discussion of science fiction and storytelling prompts Reynolds statement that Haraway is digging deeper to scrutinize science and wonders what good scientists can say about this. Reynolds concludes that "her shells are quite harmless" (P7) and is therefore not threatened by her on a personal level.	
	Reynolds uses metaphors like scientists are under "attack" and scientists may be expected to "damage the enemy" (P8).
	Paradigm shifts come from scientists themselves according to Reynolds. This seems to reaffirm that scientists still have control, rather than external factors. Science is still considered authoritative by Reynolds.
Haraway does realize that primate behavior can be "described" and "understood". Unlike Misia Landau above, he cites the example that Haraway sees that the "centrality of female primates" (P9) as progress to show that Haraway does believe in the material world. She is not a relativist.	
	Ultimately, however, Reynolds believes that her work does not improve on an understanding of the non-human primate world because she does not tell us anything about the real world; this is a limitation of deconstruction that Haraway has shown herself, says Reynolds. Her work, according to Reynolds, does not "touch on the scientific enterprise" (P10).

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